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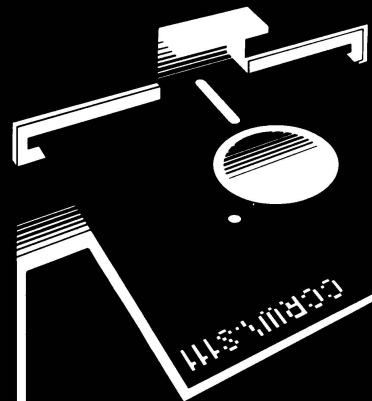
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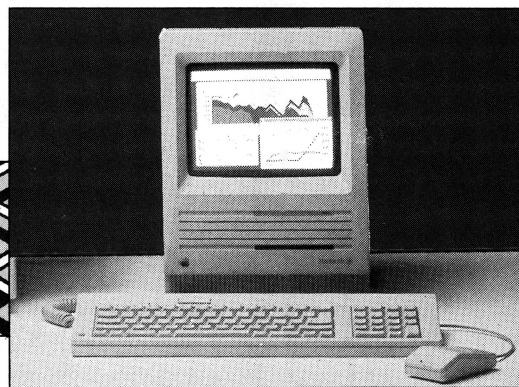
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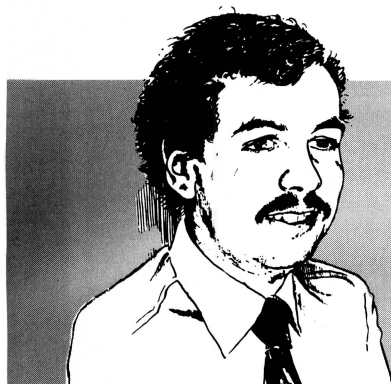
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Return to the Parker PC

I'VE WRITTEN BEFORE about the opportunities and the problems presented by ever-advancing PC technology. And I've also written about the inability of the marketplace (that's us, the users) to absorb overly-complex technology. In the last few weeks, I've come up against a classic example of this.

I'm actually writing this article in a hotel room in Amsterdam, and yes, I do mean actually *writing* — you know, with a pen and paper — what a strange sensation! I'm lecturing in Europe, armed with more computer power than many companies possessed a few years ago, yet embarrassingly, the whole electronic *tour de force* is reduced to total impotence in the face of simple human inertia.

In my travels, I have often thought how useful it would be to connect with our office computer, to transfer files, use electronic mail and so on. The obvious way to do this is through national packet-switched networks such as OTC's MIDAS and MINERVA, Telenet and Tymnet in the US, the British Telecom Gold and others. Unfortunately this is not feasible — not for technical reasons, primarily, but administrative ones.

It is currently impossible for travelling consultants to use networks unless they have a permanent presence or address in the countries they visit — except in Australia where OTC (progressive as always) has allowed visiting journalists to use their services and charge them to American Express. Other PTT administrations, while routinely trying to sell their services to electronic funds transfer operators, have never thought of

electronic funds transfer as a means of collecting revenue. Whatever their reasons, using packet-switched networks internationally is nowhere near as easy as using voice lines.

Which leads to the next idea — just dial internationally through to Australia and do a direct link, instead of via packet network. Fine — but have you seen the variety of phone jacks around the world? Every country is different, and I'm beginning to suspect some kind of global conspiracy to keep the various connector manufacturers in each country protected from imports.

A direct connect modem could be used with some crocodile clips and a screwdriver perhaps, provided one knew the colour coding used in different countries, and provided your hotel doesn't boast the latest digital PBX. What's the answer — the acoustic couplers we gave up five years ago?

Even if I could connect a modem to the phone line, there's the problem of different modem standards set by Ma Bell (no relation), the EIA and CCITT. Two modems? So much for portability.

International packet-switched networks are fine for multinational companies, who are permanently connected at all ends of the network, but until they are easy to connect to, and be billed for usage on, they will not replace the time-honoured communications media of telex and the more recent fax.

Hence my reliance on the Parker PC (Pen Communicator) Hope you can read this... (*Between the blurred fax we received the copy on and Les' lack of familiarity with the PC's digital interface, it wasn't easy.* — ed.)

LES BELL

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MICRO STOREBOARD SCOREBOARD

YOUR COMPUTER'S Personal Computer of The Year Awards allows us the best insight into what is new and technologically significant on the local market, but what happens to those creations after they hit the street? Micro StoreBoard, a monthly service from Compass Research, tracks invoiced sales of these machines and their software (valued at more than \$1,000) through third-party channels. The awards this year saw the addition of two new categories covering printers and the best microcomputer supplier.

IBM's PC/XT has regained the number one position in the personal computer stakes, winning the Micro StoreBoard Award for best-selling personal computer for 1986. This victory reverses last year's result which saw Apple capture the 1985 award for the Apple IIe.

IBM's success with its PC/XT apparently derives from heavy discounting of its machine by dealers to counteract the resurgence of XT clones into IBM's market, according to Jo-Ann Booth, Micro StoreBoard editor and Compass Research analyst. As she pointed out: 'The PC/XT achieved an overall market share of 12 per cent for the year, accounting for 57 per cent of IBM's total microcomputer sales volume. In fact, the XT segment of the market was the major one, accounting for more than half the year's micro sales.'

The XT faced some stiff competition from such notables as last year's winner — Apple came in second with the IIe, and third with the Macintosh, and even the IIc came in seventh. As well as first place, IBM took sixth with the AT and tenth with the PC.

Other contenders in the Top Ten were the NEC APC III in fourth place — the same position it held last year. NEC's decision to make the APC compatible with IBM software undoubtedly contributed to this continuing success.

An improver in the awards was the Olivetti M24, which came in at seventh place last year, but picked up added interest to finish up fifth this year.

The Compaq Portable made it onto the list for the first time at number eight. It's the first in the Portable range released by Compaq — the Portable III (nomenclature aside, it was the first in the series) was released in February with the fanfare now expected from this high-flying new-comer to the computer world. This machine could attract considerable interest this year through its powerful combination of features.

The Cleveland PC/XT demonstrated the popularity of the XT range and also the encroachment of clones on the IBM market — the Cleveland settled at number nine, just ahead of the IBM PC.

The Software Top Ten

In the software arena, the Top Ten for 1986 was: 1) Lotus 1-2-3, 2) Appleworks, 3) dBase III Plus, 4) Multimate, 5) Microsoft Word, 6) Open Access, 7) Displaywrite 3, 8) Microsoft Excel, 9) Word Perfect, and 10) Wordstar.

A tussle has developed between Appleworks and Lotus 1-2-3 for market domination in the software division. Last year, Appleworks claimed victory through its coupling with the winning Apple IIe computer. Lotus has likewise capitalised on IBM's success.

Ashton-Tate consolidated its dominance of the database market with the resounding success of dBase III Plus after the groundwork had been laid by the good performance of dBase III.

Multimate continued its command of the word processing packages available, still being followed closely by Microsoft Word. The industry standard, Wordstar, showed a decline to tenth spot following the release of various new rivals in the word processing market and it looks set to be put to rest as new versions are released.

Best Suppliers

The best microcomputer supplier of the year was awarded to strong-

Micro StoreBoard

1986 TOP TEN*

PERSONAL COMPUTERS	RANKING	PC SOFTWARE
IBM PC/XT	1	Lotus 1-2-3
Apple IIe	2	Appleworks
Apple Macintosh	3	dBase III+
NEC APC III	4	MultiMate
Olivetti M24	5	Microsoft Word
IBM PC AT	6	Open Access
Apple IIc	7	Displaywrite 3
Compaq Portable	8	Microsoft Excel
Cleveland PC/XT	9	Word Perfect
IBM PC	10	WordStar

*Based on research conducted on a monthly basis from third-party resellers throughout Australia in 1986. Personal Computers list price \$1,000 and over. Rankings by units sold.

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marketeeing Apple. Apples' year was marked by a 16 per cent increase in total unit sales over 1985, a greater number of sales of the Macintosh to the government market, where it captured a 14 per cent share, and the corporate sector, in which it gained a five per cent market share.

The best selling software supplier was awarded to Microsoft. The company's 1986 base of products in MS-DOS and Macintosh environments boosted its total sales; other suppliers have not had the same success in both environments.

Best Selling Printer and Printer Supplier

The Epson LX86 took out the inaugural printer award with Epson also capturing the best-selling printer supplier award. 'This was a particularly successful move into the education and small business markets,' according to Compass. 'As a whole, Epson has the most popular range of printers, and can boast a firm base among Australian dealers and great strength in the low end of the market. It captured a 29.5 per cent share of the total printer market in 1986.'

THE NEW TOKYO TRON

Japan appears to have taken the American underdog creation, *Tron*, to heart with moves to create their own operating system in the face of the master American programmers.

Ken Sakamura, a computer architect at the University of Tokyo, has set about rewriting the rule books and is looking to give away his creation with the hope that it will set the standard for a new family of super-fast machines.

Following in the footsteps of the American science fiction movie *Tron*, where a new program fought against the established program and won! Sakamura's new version has taken the same stance and has even gone so far as to be called TRON (The Real-time Operating System Nucleus).

Support is growing with nearly 50 Japanese members hoping that the new operating system will give Japan the break it needs in a world market currently dominated by the US. Sakamura aims to develop entirely new computer hardware and software that will make machines easier to use and more compatible with other computers.

The market for the latest 32-bit microprocessor generation is expected to grow from US\$60 million (A\$91 million) a year to US\$400 million by 1991, but Motorola and Intel are refusing to licence their new 32-bit designs for manufacture by the Japanese — this highlights the effective control by US companies over the Japanese development.

Fujitsu and Hitachi have announced a joint venture to develop a 32-bit TRON microprocessor which they say will be on the market by the end of this year. NEC has introduced a TRON operating system for use on its own microprocessors, Matsushita Electric is working on a TRON chip, and Toshiba is developing a TRON personal computer.

According to industry sources, rivalry among Japanese companies may see the plan for world domination nipped in the bud in Japan's own back yard.

An Hitachi spokesman conceded that the US had a big

headstart and said the company did not expect TRON to become a worldwide standard, although they hoped it would become one of several viable alternatives. □

BUSINESS GETS VECTORISED

Vector processors, once considered the domain of scientific and engineering labs, are becoming strategic weapons in the arsenal of the financial services industry.

Wall Street brokerages are employing these specialised processors, which calculate long strings of mathematical equations more quickly than traditional scalar processors, in applications ranging from portfolio analyses to programmed stock trading.

Moreover, other segments of the service economy, including insurance carriers and utilities, are beginning to use vector processors for applications such as actuarial forecasting and utility rate setting.

Convex SuperComputer Australia, Lionel Singers' latest company (after the recent sale of his Wicat operations), is marketing what it calls a minisupercomputer, a US\$695,000 (A\$1.39 million) machine that combines a vector processor and a minicomputer.

Among Convex's US clients are the New York stock brokerages Goldman Sachs & Co. and the Bear Stearns Companies. Both brokerages are currently handling Convex (US) initial public stock offering and wouldn't disclose how they are using the computers. Several other brokerages that either now use vector processors or have ordered them, also refused to comment, citing the sensitive strategic nature of the technology.

Although vendors such as Convex have had success in selling to Wall Street, it is IBM's recent entrance into the market that is expected to expand it. IBM offers a vector processor attachable to its 3090 mainframe for a base price of \$370,000. Sperry, Blue Bell, PA and Honeywell, are also marketing vectors. Sperry sells an attachable facility to its 1100/90 processor. Honeywell's offering is the DPS/90, a mainframe with vector and scalar processors manufactured in Japan by Nippon Electric.

IBM's plug-compatible competition also offers vector processors. The one offered by Amdahl (US) is manufactured by Fujitsu and is a standalone supercomputer that performs both vector and scalar processing. National Advanced Systems (US) recently announced new vector processors that it claims provide almost supercomputer performance for its new high-end mainframes, which are made by Hitachi.

Although IBM says the primary market for its vector product is the scientific community, orders have been strong outside that sphere. Financial service providers 'of various flavours' have ordered the product according to IBM.

One potential drawback of using vector processors is the death of third-party software written for commercial vector applications. For some users, however, this is not a problem. For example, the equations used by brokerage houses in financial modeling are all top secret, so writing proprietary applications is necessary.

Two trends are converging to cause the new interest in vectors, said Omri Serlin, a consultant with Itom International. 'Twenty-five years ago, you didn't see large-scale financial modeling being conducted on a computer,' said Serlin, noting that trading in stock options, which has resulted in programmed trading, is a relatively recent phenomenon. 'There was no need to create massive models, which are now at the heart of buy and sell decisions.'

'The second trend is a drop in prices for these specialised processors. The more reasonable cost of this hardware makes it attractive,' said Serlin who predicts the vector processing market will grow at least twice as fast as the data processing market during the next few years. □

A PROFITABLE IMPACT

Australia's only manufacturer of laser printers, Impact Systems, has received an injection of \$750,000 from the Adelaide-based venture capital group SA Ventures.

According to a company spokesperson, it is to be used to fund continued development of Impact's local operations and its expansion into further overseas markets. □

SURGICENTRE BRAINCHILD

Perth's \$5.5 million Surgicentre, opened in January by Western Australia's premier Brian Burke, has received the latest state-of-the-art computerised patient management system.

The centre is the first major recreation in Western Australia of the successful US experience in ambulatory day care for surgical cases.

Dr Simpson, a director at the Surgicentre, estimated that up to 70 patients would be cared for daily which was the main reason for the development of the computer system.

The system has been tailored to place patients in constant contact with the centre's seven operating theatres, recovery rooms and other ancillary services and the schedules of the more than 90 staff members involved with the Surgicentre.

The system, developed by Perth-based Medrecord, will operate the scheduling, allots times for various operations, the speed at which various specialists work, types of procedures involved, equipment used, consumables and operates ledgers and payroll.

The scheduling has allowed for more effective use of surgery. As Dr Simpson said, 'The traditional way of dealing with surgical-procedure patients has been to have morning and then afternoon operating sessions, which means considerable wasted time. The computer has allowed us to introduce flexitime. This means much more efficient use of facilities but still allows for a 4.30 pm finish for operations with patients able to stay in the recovery areas until 8 pm.'

The comprehensive software package may prove very interesting to similar surgical centres in the eastern states. □

COGNITIVE SCIENCE

'The emergence of cognitive science, a new system of inquiry into the mind, promises the

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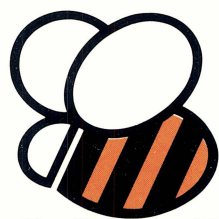
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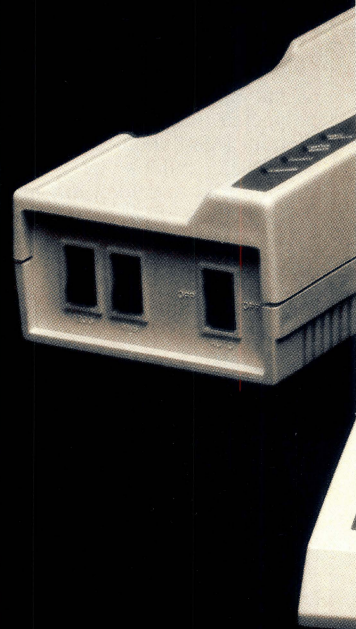
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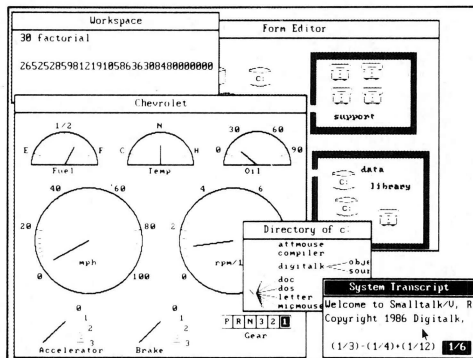
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realisation of the fantasy that some day computers will be able to think,' said Dr Peter Slezak, a lecturer at the University of NSW.

Cognitive science is aimed at gaining insights into brain functions and developing computer systems which are (apparently) intelligent. □

JOINT ACCOUNTS FOR BANKS

Users of Australia's two largest eftpos networks will soon be able to use either system. The National Bank and Westpac have announced the interchange between their plastic card account holders similar to the NSW based exchange between building societies. The new move will open up more than 2900 terminals nationally, operating through retail stores. □

DISAPPEARING HACKER

One of the first computer hackers to draw attention to electronic crime, Mr Bill Landreth, disappeared from a friends home in San Diego. The author of a trail-blazing book about the computer hacking problem, *Out of the Inner Circle*, Landreth disappeared leaving a suicide note. □

AUSSAT FOR AUSSIES

Australia's domestic satellite operator, Aussat, has received strong Federal Government support for its proposal to only accept tenders for the next generation of satellites that include a high level of Australian industry involvement. □

COLES/MYER SPENDING SPREE

The Coles/Myer Group have splashed out with the recent purchase of more than \$2 million worth of hand-held computer equipment in a major store upgrading program.

The Group placed the order for 1,600 hand-held terminals with Telxon Australia, the Australian subsidiary of a leading hand-held computer manufacturer.

Coles/Myer are the largest user of portable tele-transaction computers in Australia with 1,535 in

use prior to this latest purchase.

The new terminals are the Telxon PTC-701, an identical unit to that ordered by the US military in a \$50 million contract last year. The new units supersede the original model which was first introduced in 1978. The new portables will be covering bar code scanning, printing, two way communications and custom application software.

The system provides the Group with economical quantity ordering for sales and promotional periods. Stores use the system to record remaining inventories after the sale, monitor daily sales volume and monitor inventory to determine the cost of inventory on hand.

New units have already been installed in the Fossey chain and Coles stores have started to take delivery. □

ANIMAL FARM

Sydney's Toronga Park Zoo benefited recently from the donation of a personal computer to store files on animal diseases. The Zoo's non-domestic animal pathology registry was set up 18 months ago and is a valuable library of information on animal diseases.

The Registry, under the direction of veterinary pathologist, Dr Bill Hartley, has been a manual card system to date set up to collate a variety of sources. This is now to be placed on a database management system supplied by Oracle, using a PC and printer donated by Olivetti.

The system has been customised by Human Interface to look at such areas as the causal agent of the disease, organ system involved, date of acquisition of specimen, taxonomic classification and entry of new specimens will be greatly simplified.

The facility will allow data to be available to other zoos, tertiary institutions, government laboratories and even overseas researchers. □

CSIRO SUPERCOMPUTER

Australia's research institute, the CSIRO, has purchased a Control Data 205 supercomputer for \$3.7 million in a move to help keep Australia internationally com-

petitive in computing. The CSIRO's computing division, Csironet, has been renting the machine for the past two years while its usefulness has been assessed.

CSIRO will pay less to buy the computer than if it had continued with the lease agreement, paying the 3.7 million rather than US\$4.76 million. Not bad for a machine which has a 16 million byte memory and is able to perform 400 million calculations a second.

The industry is set to benefit from the purchase with the CSIRO, Csironet and the Department of Science formulating a policy to provide the computer to potential Australian users with researchers from universities getting the same priority as CSIRO researchers.

Usage has improved over the two years they have had the machine, although it got to a slow start as not many companies or institutions were able to capitalise on the computing power available.

The supercomputer is used primarily by CSIRO and university researchers, government departments such as the Bureau of Meteorology and, increasingly, private companies. □

OSI BOOSTS INFO INDUSTRY

Australia will be receiving a co-ordinated guideline to a national communications standard with the opening of the National Protocol Support Centre in Melbourne.

The new centre will be providing current world-wide information on communications standards such as the Open Systems Interconnect (OSI) and Integrated Services Digital Network (ISDN), to Australian companies in the communications field.

There has been a crying need for a uniform communication standard between companies in the same country, let alone on a world basis — the Tower of Babel has been looming over the industry with the *almost* unlearned lesson in common communications.

Ultimately OSI is intended to lead to unrestricted communications between different makes of

computer systems (in much the same way as telephones can connect globally).

NPSC will be providing local companies with information on the overseas standards to help determine export potential.

The NPSC, which is to be commercially-oriented, is initially sponsored by Telecom, OTC, the Department of Industry, Technology and Commerce (DITAC), CSIRO, the Victorian Department of Industry Technology and Resources (DITR) and the Australian Information Industry Association (AIIA). The organisation will be run by a board of directors chaired by Mike Rydon.

Consultancy and advice services on specifications, verifications, design, development and testing techniques will be available from them. Industry will be provided with facilities to test prototype systems and to conduct experimental trials, in addition to advice on conforming. Other services will include workshops, special interest groups, library, publications and newsletters. □

BIOLOGICAL CHIP

With Australia leading the world in genetic chemistry, a recent move toward the creation of a biological microchip will hopefully see the best resources and the best chance for Australia to develop a new form of intelligence.

The firm, Adelaide biotechnology company Circadian Pharmaceuticals, has invested in the venture to create the biological chip. □

LEARNING JAPANESE

Japanese interests are planning to build a \$100 million technical college and technology exchange centre complex in Sydney, the NSW government announced recently.

The Kyoto Institute of Science and Technology has proposed a 35-story building in Pitt Street to house the complex. □

EPSON, SWEET MUSIC FOR SS0

Epson has taken the giant step of sponsoring the Sydney Sym-



phony Orchestra to the tune of A\$1 million for the 1987 and 1988 seasons.

The sponsorship will also go towards the SSO's overseas tour during the Bicentenary Year, 1988. The SSO will make an extensive tour of the US and will play at the United Nations Day Concert in Washington in October 1988.

Managing Director of Epson,

Shuzo Isoda, said that Epson had given the sponsorship to the SSO as an investment in the promotion of Australian culture.

Nola Charles, chairman of the SSO said of the sponsorship agreement: 'Epson Australia is the first private benefactor of an ABC symphony orchestra. Their interest in the orchestra is born out of their success commercially in Australia and a desire to

give something in return. No one could honestly believe that sales of personal computers would skyrocket by investing \$1 million in advertising an orchestra.' □

BENDIGO ACCEPTS IDAPS' NEW SYSTEM

Bendigo Building Society is the first user of Idaps Australia's new retail finance system (IRFS).

With an order worth more than \$5 million over five years, Bendigo Building Society has agreed to purchase the software license, a five-year support and enhancement program and processing services. The software package will form the basis for the societies new generation of computer systems. □

COMPUTERS KILLING FLU?

A group of Melbourne scientists are using advanced computer

graphics to design a new drug for the treatment of influenza of any strain.

The research is being conducted by Biota Holdings, a Melbourne biotechnical company based at the Victorian College of Pharmacy, under the direction of Professor Peter Andrews.

The development is based on structural information relating to a protein on the surface of the influenza virus. The protein, known as neuraminidase, is thought to be responsible for the spread of the virus through the body.

Work on the isolation and characteristics of the virus, and the determination of the neuraminidase crystal structure, has been conducted by Dr Graeme Laver from the Australian National University and Dr Peter Coleman from the CSIRO, who are also involved with the Biota project.

Professor Andrews' team is using computer graphics to de-



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sign molecules to fit the active site of neuraminidase. They hope this will inhibit the spread of the virus through the body.

Computer graphics is being used to help visualize and quantify ideas. Professor Andrews' team is able to see the target area on screen and then calculate the correct geometric placement for the individual atoms in the drugs, more accurately and more rapidly than was possible before.

The previous method of developing drugs was a process of random screening. Under that process only one in every 10,000 chemicals tested eventually became a marketed drug.

Professor Andrews believes that drug design (which is being used in the development of the drugs we will most likely use tomorrow) will greatly reduce those odds. Designing drugs that fit targets precisely will lead to drugs which are more potent:

that will result in our needing less of them: that will probably reduce the number of side effects.

This could end up being a classic case of the computer helping its own since the airconditioned cells that many programmers work in are a haven for such viruses.

Professor Andrews claims that the development of the influenza inhibitor for Biota is 'very much on track'. He said they were working on leads that looked very promising. □

COMPUTER REHABILITATION

Computer rehabilitation, a new discipline still in its infancy in Australia, is getting greater recognition with the acceptance of the discipline in hospitals.

Melbourne's Cedar Court Private Rehabilitation Hospital is one of only a handful of centres

using the new method of accessing and retaining cognitive, perceptual and sensory skills.

The hospital has developed a range of programs to help patients who have suffered brain damage through stroke or accident. The computers are used to assist people to regain their memory, improve problem solving skills, make their thoughts flexible or teach spacial concepts or relations.

The programs are non-language orientated so migrants who cannot read or write English, or people who have a language disorder, are able to be assessed and retrained on the computer.

Although computer cognitive therapy is new to Australia, Cedar Court is already working on important data which will be a world first. The hospital is compiling normative data on people over 70 who have had a stroke. This data will be vital for measur-

ing the performance of mentally-impaired people against what is recognised as the norm.

According to Cedar Court's senior occupational therapist, Heather Mudie, the information will be essential because computer rehabilitation will supersede all existing forms of cognitive therapy as computers become more commonplace. □

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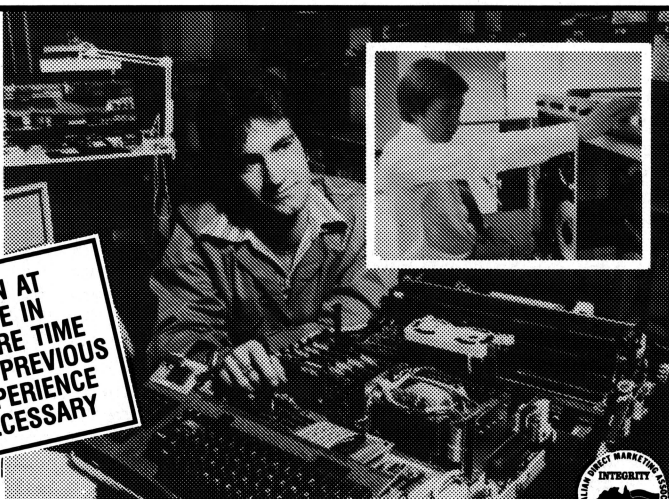
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AMERICAN GRAFFITI

BY HOWARD KARTEN

AWARDS AND THEIR WORTH

AS STUDENTS OF this column are well aware, I'm intrigued by paradox. Thus, YC's annual Computer of the Year Issue turned my thoughts to that subject. A few minutes' thought leads one to the conclusion that paradoxes and ironies abound in the idea of Computer of the Year — or, to broaden it somewhat, Computer Product of the Year.

You don't have to be out looking for paradox to be struck by this one having to do with 'Computer of the Year': change and ferment are almost synonymous with anything related to computers. Yet the older the microcomputer era gets, actually, the less change and ferment there will be. New products — especially if they're to be successful — will be distinguished more by being newer, faster, smaller, and cheaper than by being revolutionary or breaking sharply with the past.

For example, no 'Computer of the Year' can be a commercial success (that is, find widespread approval in the hands of us consumers) and also be too different functionally, from what already exists. Suppose, for example, that aliens from space gave you plans for a really fantastic micro-incredibly fast, resistant to breakdown, small footprint on the desk, phenomenal resolution on the display tube, and so on, computer. ('Aliens' is not an entirely inappropriate image since some people view computer executives and engineers as their first cousins.)

The only hitch is, it can't use CP/M, PC-DOS, or any of the other operating systems in wide, earthly use. What would happen to such a machine? I suspect the answer is, wide praise, followed by a deafening silence in the marketplace — because of the lack of a software base for the machine. Failure is by no means

certain, but success would be far from guaranteed.

A kind of practical example of this appears, at this writing, to be the 80386-based machines. Some publications here have named these machines Computer of the Year. Although most current PC-DOS software can run on them, no operating system currently exists that takes advantage of the 80386's incredible power. Thus, all they are is faster than the current crop. But communications, word processing, and spreadsheets account for the bulk of computer use, and only the last of those applications really takes significant advantage from increased speed. The result? As far as we're aware, 80386-based machines are not disappearing as soon as they're placed on the shelves.

Or take software. There's no doubt that there are fewer *categories* of new software products today, compared to two or three years ago; I have the impression, too, that fewer new software products are appearing today than in the past. It's harder for a new product to grab a significant share of the market — a new word processor, say — because users are so attached to the products they're currently using. And although new users don't have those attachments, they're no doubt heavily influenced by 'word-of-mouth' advertising from current users. Result? Revolutionary products face a major battle in winning credibility.

There are some wholly new areas, though not many, and I have a hunch that they'll be arcane. Desktop publishing is one and seems like an excellent example of a field offering many opportunities for software and hardware (laser printers, for example). But how many of us are possible buyers, or will be touched directly by products related to desktop publishing?

All this got me thinking about

some products I'd like to see that could well qualify for future Computer Product of the Year awards.

The first one is some kind of gadget or appliance that would let you use the computer in the bath or hot tub. Writing about computers can be a backbreaking task. After a hard day of processing words about computers, I often take to my bath for relaxation, where I do some of my best thinking while soaking in the warm water, with pen and cigar in hand, and glass of restorative nearby. Of course, I don't dare take my computer in with me. I'd give a major award to a product that I could use in the bath without worrying about damage — either to me (from electrocution) or the computer (from cigar ashes, water or firewater).

My wife expressed interest in a computer she should use while lying flat on her back. She says that after she wakes up and becomes moderately conscious, she often spends time writing letters in her mind. Of course, by the time she gets to her keyboard, some of those golden phrases have disappeared. She'd like some sort of computer that she could pull out from the wall behind her. (I've taken to calling this still-imaginary device a Murphy computer, after the old Murphy bed that folded up into the wall).

She says, too, that as long as I'm busy inventing imaginary Computer Products of the Year, I should figure out how to do a thought-processor, so she could transfer her thoughts directly to the computer. Well, I countered, how about a speech processor? No good, she pointed out, since she's not terribly talkative in the morning. Moreover, she notes, she and others who are not 'morning people' usually limit their early-morning verbal output to grunts and sounds, since it takes a while before the mouth

has been sufficiently limbered up and stretched to emit intelligible sounds. Yes, a thought-processor is definitely what she needs.

Here's a word processor add-on that would be a wonderful enhancement to any product now available for processing words. How about an artificially-intelligent product that would look for sarcasm or other intemperate language in the letter? If it found any, it would delay printing the letter, perhaps via that omnipresent computer question, *Are you sure?* Such a product would be a welcome counterpoint to the genuine stupidity which humans sometimes practice.

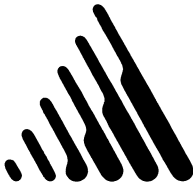
On a more serious note, a write-protect device for a hard disk would be a terrific invention; they've had them for years on mainframe computers. How about a toggleswitch on the chassis, or a button on the keyboard that you'd have to press in order to be able to write anything on a hard disk.

Until these products appear, I'll keep using my current hardware and software. It's been a few years since they were Computer Product of the Year, but they certainly had a revolutionary effect on my life.

CONNECTIVITY

'Connectivity' between systems apparently will be a major goal of IBM and IBM products in the future. This was the news out of a meeting between major IBM customers and IBM.

Following the approach that's been heavily used in the past by other computer vendors, IBM recently gathered 200 of its largest customers to get their views and needs and to inform them of IBM's plans. Attendants of the meeting said IBM stressed its 'Systems Applications Architecture' protocols, which apparently will be used to improve portability of applications. □



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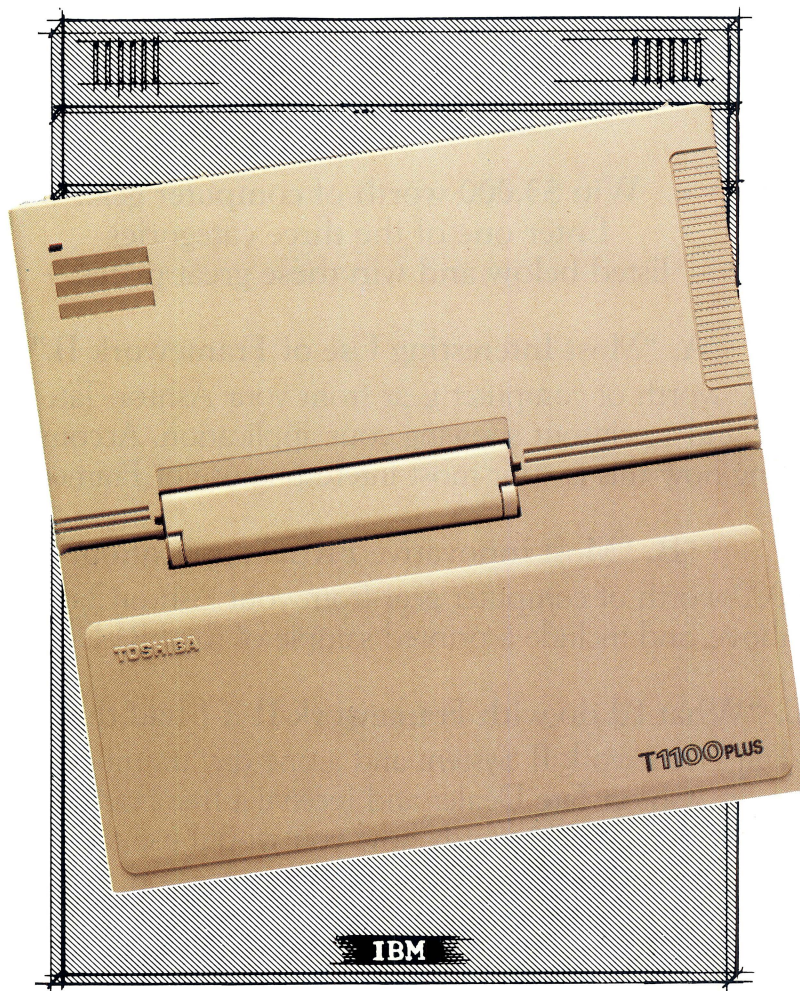
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1. How long have you been using personal or microcomputers? _____
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Rules & Conditions

1. Instructions on how to enter and prizes form part of these conditions of entry. 2. Entries close last mail 31 August, 1987. Winners will be notified by mail and their names published in 'Your Computer' magazine October issue, 1987. 3. This is a game of skill and chance plays no part in determining the winner. Each entry in categories A, B and C will be individually judged in accordance with the stipulated criteria and instructions. The judging will be done by a panel of industry experts selected by the promoter. The judges' decision will be final and no correspondence will be entered into. 4. The promoter is Ashton Tate Pty Ltd, Unit 2, 80 Berry Street, North Sydney, 2060. 5. Categories A and B can only be entered by owners of Framework II. Category C may only be entered by non-owners.



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convenient viewing angles. Not just a few.

Of course, the Toshiba T1100 PLUS does have a few things in common with the IBM portable. Like complete IBM compatibility. And two built-in 720K 3.5" disk drives. It's just that it has these things in a smaller, lighter, faster, more portable, more affordable package.

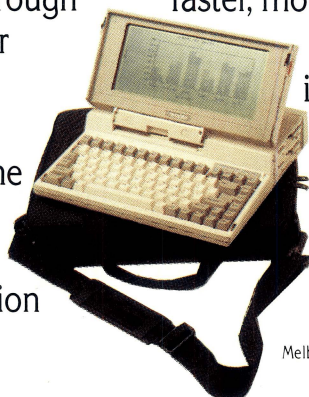
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Personal Computer of the Year Awards — the Finalists!

THE FIFTH ANNUAL Personal Computer of the Year Awards should have been easy to judge, what with four year's experience behind us: but it wasn't. Early in the judging we were struck with the perennial problem of trying to compare products at the leading edge of technology (which every techno-buff would love to own, but couldn't find a justifiable use for) with rather plain (albeit sophisticated and well-developed) offerings which could benefit every office and computer user in Australia.

Then, there's the added complication of judging a product, which has been on trial in the market place for over a year, selling well, against the latest technology which only just managed to come out in time to qualify. And, as happens every year, there were products which we would have loved to include but which didn't qualify under the rule that at least 50 units had to have been sold in the preceding calendar year.

When the short-listed products — more than 30 in all — were brought together for final evaluation we wondered if we would ever see the office again. (So many cardboard boxes, so much bubble-wrap, shrink-wrap everywhere and styrofoam beads in everything — welcome to the Age of Packaging.) Every available space in the office was used to set up the machines and each machine was used to test the software being judged. This year, the majority of finalists were IBM compatible — perhaps the much-touted 'standard' is at last really becoming a standard.

When it came time to judge the Personal Computers themselves we found ourselves in a dilemma: how can the megapower of machines designed as engineering tools and the emotional impact of fun machines with lots of graphics and sound be asked to compete with one another? Again and again as the power versus fun arguments arose, we had to return to basics and stringently apply the criteria.

Likewise, judging the software products

meant having to compare products running under different environments and performing vastly different functions. On one hand we had simple utilities and on the other we had the most sophisticated software around, yet each has its own place.

Reader's are invited to submit their own list of winners for each of the four categories: if it matches the Panel's we'll happily award you a two-years' subscription to Your Computer. To be eligible, your entry must reach us before April 7th.

The major criteria (all approximately equal in importance) used by the Panel during evaluation are these —

- **Technical Excellence** in design and engineering, including quality, reliability, 'feel,' and features.
- **Ergonomics** in terms of both software and hardware design.
- **Value:** Are the features and functions worth the price tag?
- **Presentation:** How does the product look? What are the documentation and packaging like?
- **Innovation:** Is the product new and different; does it truly represent an innovative approach?
- **Market acceptance:** What do users think about the product? How well has it been accepted?

Note that the Award Panel do not feel

constrained to consider only these criteria. With the current (*geometric!*) rate of development in the industry, a product that breaks all the rules could be released at any time and be precluded by these 'prejudiced' criteria.

Well, these are the finalists and you can do a Sherlock Holmes if you like, and try to work out how we voted. In fact, reader's are invited to submit their own list of winners for each of the four categories: if it matches the Panel's we'll happily award you a two-years' subscription to *Your Computer*. To be eligible, your entry must reach us before April 7th. Right now you can bet the finalists are trying to pick the winner — everyone will find out together on April 27, 1987, when we announce the winners at the Awards Ceremony and simultaneously release our May issue for sale.

The 1987 Personal Computer of Year Awards Finalists, listed alphabetically by category —

The Personal Computer of the Year —

Apple IIGS,
Chendai Laptop,
Commodore Amiga,
Compaq Deskpro 386,
Toshiba T3100,
Wang PC Portable.

Australian Hardware Commendation —

ECS 286 AT from Earth Computers,
Tosbox from Offcom.

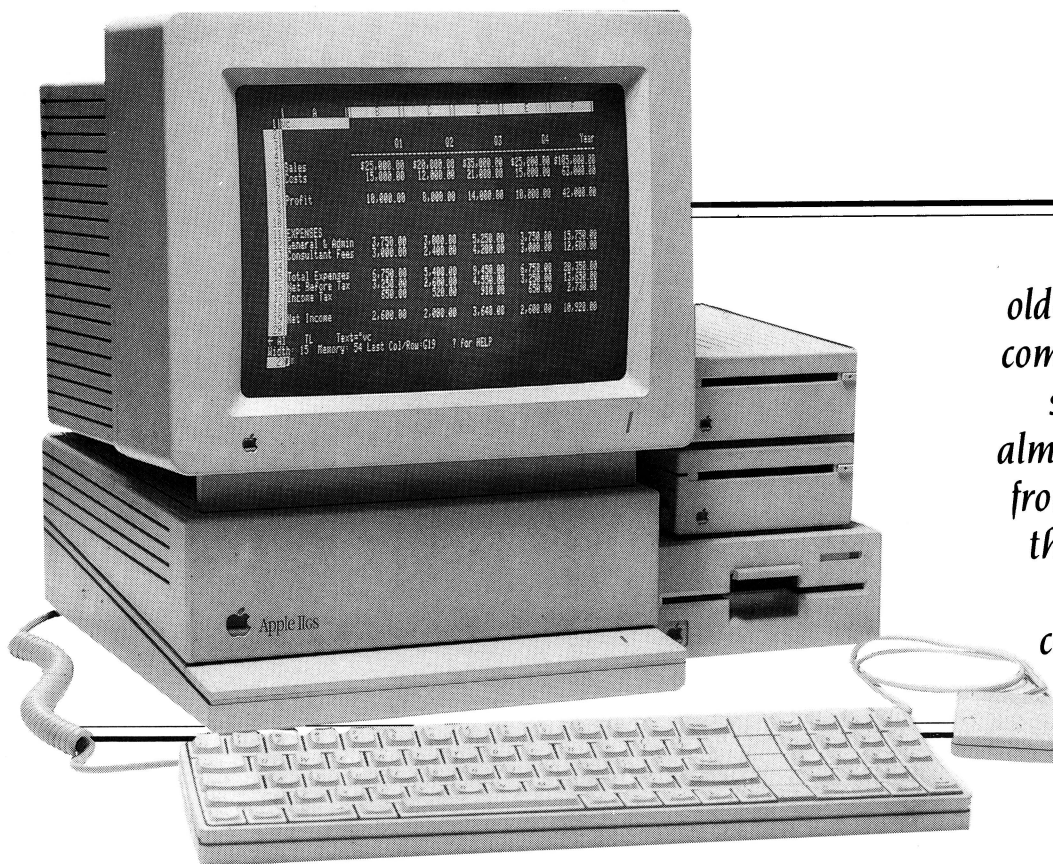
Software Product of the Year —

Access from Microsoft,
DESQview by Quarterdeck,
Harvard Presentation Graphics,
Javelin by Javelin Software,
Mace Plus from Mace,
Pagemaker for the Mac from Aldus,
System Builder from Atech,
Personal Consultant from Texas Instruments,
Turbo Prolog from Borland.

Australian Software Commendation —

Ace Cobol from Austec,
SuperCom from Operating System Research,
XL from ISR

Apple II GS



Apple is one of the old-timers of the personal computer business, having survived longer than almost any other company from those heady days of the mid-seventies when the phrase 'personal computer' had not yet been discovered.

THE ORIGINAL APPLE II was introduced back in 1977, and in recent years has been overshadowed, particularly in the business and professional market, by the IBM PC and its clones. Nonetheless, the II, in its recent incarnations as the IIe and IIc, has continued to do surprisingly well, maintaining its position strongly in the education market and the difficult to define 'home' market. This is due to the vast amount of software and support for the machine.

The Apple IIGS extends the II product line and is expected to carry it into the '90s. Based on a new 16-bit processor, the 65C816, the new machine is nonetheless able to run the vast bulk of software written for its predecessors, and is able to do so some 2.8 times faster — in itself a worthwhile improvement, even without the machine's other new capabilities.

The physical design of the machine is startlingly different from the earlier IIe which it effectively replaces, having (at last!) a separate keyboard and system

unit. The keyboard is compact, yet boasts a numeric pad and a full keyboard — there are no missing keys as with earlier machines (albeit the cursor keys are badly placed). The keyboard connects to the system unit via Apple's Desktop Bus (ADB) — the connector plugs into either end of the keyboard and the new optional ADB Mouse plugs into the spare socket at the other end of the keyboard.

The display characteristics of the machine have also been significantly overhauled: it now boasts 640 x 200 resolution, with up to four colours per line and 128 colours per screen, from a palette of 4096 colours (the 640 x 200 sounds familiar — can Apple be planning IBM compatibility for this machine?). The result is staggering graphics for a machine in this part of the market.

For compatibility with the earlier II's, the IIGS also runs double-high-resolution (560 x 192, 16 colours), double-low-resolution (80 x 48, 16 colours), high resolution (280 x 192, 6 colours) and low resolution (

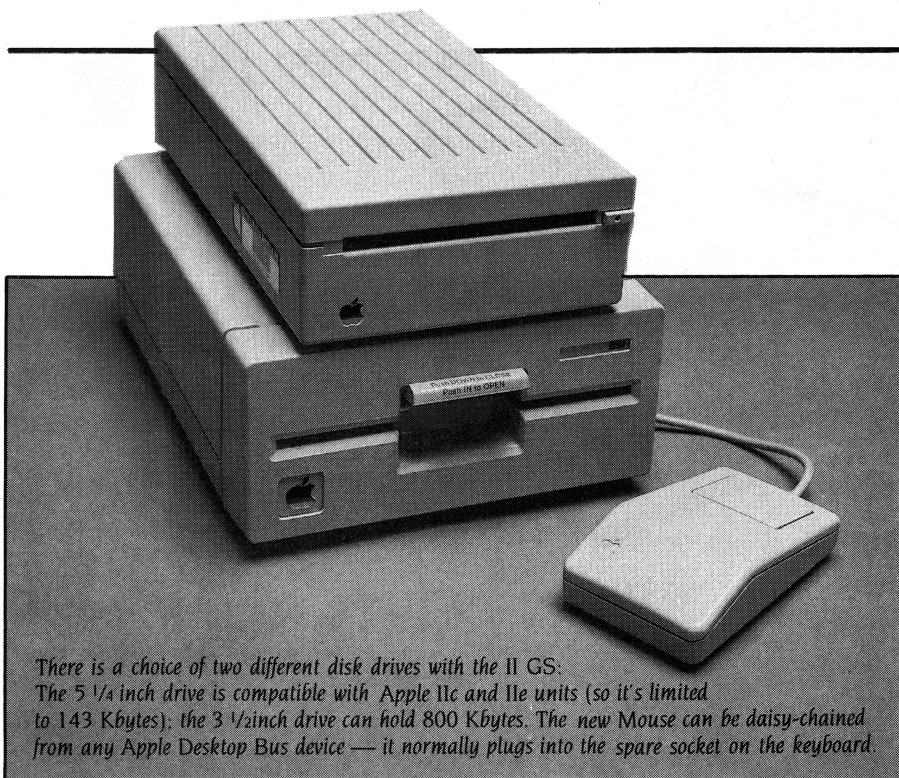
40 x 48, 16 colours). Of course text can be displayed in either the 80 x 24 or the 40 x 24 formats.

A Sound Machine

To match the excellent graphics, the IIGS also boasts excellent sound, thanks to the Ensoniq 32 oscillator synthesiser chip. This device allows software to generate up to 15 different musical voices, of amazing realism. It's hard to say what home computer owners do with their machines, but we venture to suggest that anyone with music in their soul will find this machine near irresistible.

The IIGS will accommodate up to 8 Mbytes of RAM and 1 Mbyte of ROM, with 512 Kbytes and 128 Kbytes of each as standard. As in the Macintosh, the ROM contains a swag-bag of useful routines, including the QuickDraw II graphics drivers, Applesoft BASIC, the memory manager, AppleTalk network protocols, device drivers and other goodies.

Internally, eight expansion slots (one ▶



There is a choice of two different disk drives with the II GS. The 5 1/4 inch drive is compatible with Apple IIc and IIe units (so it's limited to 143 Kbytes); the 3 1/2 inch drive can hold 800 Kbytes. The new Mouse can be daisy-chained from any Apple Desktop Bus device — it normally plugs into the spare socket on the keyboard.

for memory, the other seven general-purpose) allow considerable expansion — especially since most of the things that used to be add-ons are standard on the Apple IIGS.

Users have a choice of external disk drives — either a 5 1/4 inch unit compatible with the earlier units (and therefore limited to 143 Kbytes), or a 3 1/2 inch drive of 800 Kbytes capacity. We suspect a lot of owners will use both. For the serious user, there's also the Hard Disk 20SC, with 20 Mbyte capacity.

The IIGS runs a choice of operating systems: ProDOS 8 and 16, the most recent O/S's for the II range, as well as Apple Pascal (read UCSD p-system), good old DOS 3.3 and CP/M (with a Z-80 card). One suspects a lot of these machines will run DOS 3.3 a lot of the time, but new software will be written for ProDOS 16.

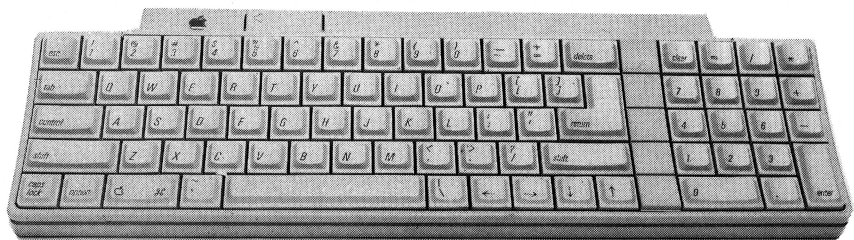
In particular, thanks to the inclusion of the QuickDraw routines in ROM and a modular software design, the IIGS includes the same software architecture as the Macintosh, and can do many of the same kinds of things.

With the MouseDesk software, the IIGS display looks very like a Mac's — at least that's the intention according to the photos in the brochures — but we found that the resolution was not as high as on the Mac screen (an inevitable consequence of the use of a colour monitor) and that colour information was making text on the screen look like a badly-smudged Smartie packet (not an inevitable consequence). We could only conclude that our unit was either faulty or

there was something wrong with the software.

However, it is encouraging to see Macintosh-style technology appearing, in colour, on a machine which is already a standard in education and home use. Apple's design engineers have done a good job of retaining all the benefits of previous machines while opening up new horizons. We feel that this is going to be important in new machines: users do not want to leave behind software which they have purchased and learned, just to achieve performance improvements or new features like mouse-driven software.

In realising that, and capitalising on it in the design of this machine, Apple has shown many other manufacturers how it can be done. □

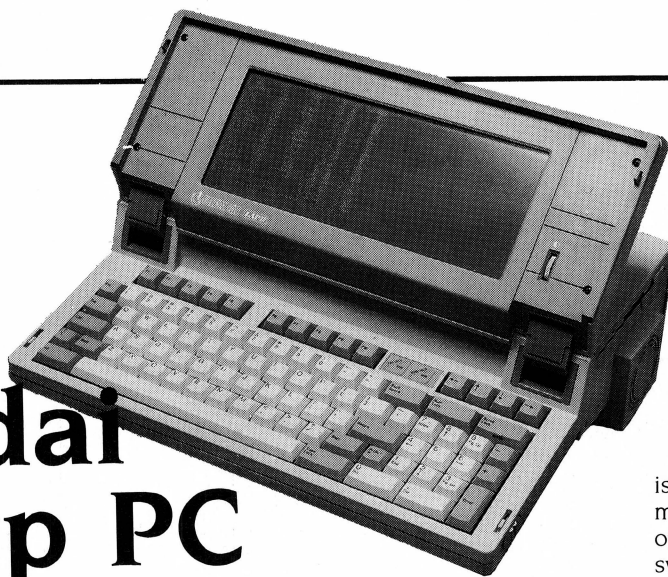


The keyboard is an 80-key unit with a 14-key numeric keypad; it has two Apple Desktop Bus connectors — one for connecting the keyboard to the computer and the other can be used for daisy-chaining another input device. The keys can be formatted with the Control Panel to give a qwerty or Dvorak layout in any one of nine international layouts.

Product Details

Product:	Apple IIGS
Made By:	Apple Computer Corporation
Review Machine from:	Apple (Australia) Pty Ltd 37 Waterloo Road, North Ryde 2113 NSW (02) 888 5888
Processor:	16-bit 65C816
Clock Speed:	1.0 to 2.8 MHz
RAM:	512 Kbyte expandable to 8 Mbytes
ROM:	128 Kbytes expandable to 1 Mbyte
I/O:	Seven general ports
Language:	Special
Keyboard:	Standard qwerty plus 14-key numeric pad
Display:	Choice of monochrome or colour
Graphics:	Up to 650 dot horizontal and 195 vertical with an available 16 colours
Peripherals:	Considerable
Expansion:	Eight slots, one for memory
Options:	High and low resolution screens
Price:	\$512 Kbyte \$2,660, colour monitor \$1,299

Chendai Laptop PC



The idea behind a 'laptop' computer is a good one that should have won users over in droves by now — but, to date, the keyboards have been a cramped compromise, the screens are generally unreadable, or expensive options were unavoidable. With their Laptop PC, Chendai have gone a long ways towards overcoming all of these barriers to acceptance.

is that of 'portable' — it's almost the ideal machine to be taken home on weekends or carried to a client's office for instant answers or used in a hotel room.

Machines like the Chendai win favour because of the thought that has been put into functionality and the inclusion of such features as CGA RGB output, parallel and serial ports and a full expansion bus for connection to an external card chassis.

Chendai themselves are making no attempt to sell this machine as anything other than a full-featured XT compatible. The fact that the XT is currently the most acceptable (read 'largest selling') PC shows that they're on the right track so far as the market is concerned.

The computer's portability is enhanced by the standard equipment carry bag which has room for the cables plus the included MS-DOS 3.1 manual and Complete PC Tutorial. Another plus on the side of portability is the screen — using a 'super-twisted birefringent effect' which splits the light beam into two components and results in a much sharper display than is normally found with an LCD screen, Chendai have produced a 640 x 200 pixel screen that can be read under most conditions and from most angles. The unit, which has a very solid feel to it, is in one piece — the screen hinges up to reveal the keyboard. One of the few criticisms we could level at the Chendai was it's 'packaging' — there is no builtin handle: it must be carried in both hands or in the case.

Although there are portables on the market that are more portable than this one, that didn't seem to be a major drawback. The Panel felt that the Chendai had more-than-enough features, taken in combination, to qualify it as one of this year's finalists.

The computer is completely compatible with existing PC installations and ran every PC-DOS application we tried. Not only does it use standard 5 1/4 inch disks but it has the hard disk capacity to contain all of the applications likely to be needed by one user. The screen is very readable, the keyboard is a standard layout and all the necessary ports are there. Short of a colour screen we couldn't think of anything else to add. □

THERE SEEMS TO BE a new laptop on the market every week and yet most fail to get the users vote. Either the keyboard is a cramped compromise or the screen is unreadable, the standard features are below standard or expensive options are unavoidable.

The Chendai impressed the Panel because it feels like a full-sized desktop

computer and it has the features of one, all in a portable package. Not only does it have a standard 5 1/4 inch floppy disk drive but it comes with a builtin 10 Mbyte hard disk. The only limitation it does have (and it's a limitation only if you want a true portable that can be used anywhere, anytime), is that it doesn't run from batteries.

That aside, the category it best fits into

Product Details

Product:	Chendai Lap II
Made By:	Chendai Pty Ltd, Hong Kong
Review Machine from:	Chendai Australia 109 Drummond Street, Carlton 3053 Vic (03) 663 3030
Processor:	80186
Clock Speed:	4.92 MHz
RAM:	640 Kbyte
ROM:	8 Kbyte BIOS
I/O:	RS-232 serial port, composite and RGB monitor ports with an LCD switch, printer port
Languages:	GW BASIC, most other languages compatible with IBM excluding BASICA
Keyboard:	modified PC board
Display:	80 x 25 LCD — see text
Peripherals:	RGB and monochrome monitors, printer and modems
Expansion:	expansion chassis expected late this year
Price:	\$5,195 taxed



Commodore AMIGA

THOSE WHO HAVE bought the Amiga have usually done so because of its amazing graphics or sound capabilities. While DOS users are waiting for a multitasking operating system, Amiga users smugly point out that they already have one which works very well.

The Amiga has not been the runaway hit that most industry observers felt it would be when it was released. There are many explanations offered for this: Some say that it is too expensive for a home computer and yet too adventurous for a business machine. Others feel that it suffered the chicken and egg syndrome — few developers were willing to produce soft-

ware before the machine had won acceptance and buyers were waiting for a large range of software from developers.

Whatever the reason, the newly announced versions of the Amiga (including the low-priced 500), together with the steadily increasing range of software may finally allow this excellent machine to find the success it deserves.

The Amiga now comes with Australian TV standard PAL video output and monitor, making it an ideal toy for the home video enthusiast who already has everything else. Even in low resolution mode, the colour graphics on the Amiga are astounding. Most IBM users turn green with envy. In fact, some of the graphics and

While the Amiga is certainly an amazing PC, it seems to have fallen into a no-man's land of computing. At almost \$3,000, it is too expensive for home computer, and it has yet to win acceptance as a general office machine.

Product Details

Product:	Commodore AMIGA
Made By:	Commodore
Review Machine from:	Commodore Australia 67 Mars Road, Lane Cove 2066 NSW (02) 427 4888
Processor:	M68000
Clock Speed:	7.14 MHz
RAM:	512 Kbytes
ROM:	16 Kbytes which boots up 256 Kbytes of writeable control store
I/O:	RS 232 serial, Centronics parallel, joystick, radio, stereo, video, you name it
Languages:	All common ones supported
Keyboard:	Detachable 89 key keyboard, numeric keypad, diamond cursor, 10 function keys.
Display:	Commodore 1081 colour monitor
Graphics:	640 by 512 pixels with 80 by 32 lines
Peripherals:	3 1/2 inch 880 Kbyte drive
Expansion:	Expansion card, up to 9 Mbytes possible
Price:	With monitor \$2495 taxed; without monitor \$2295

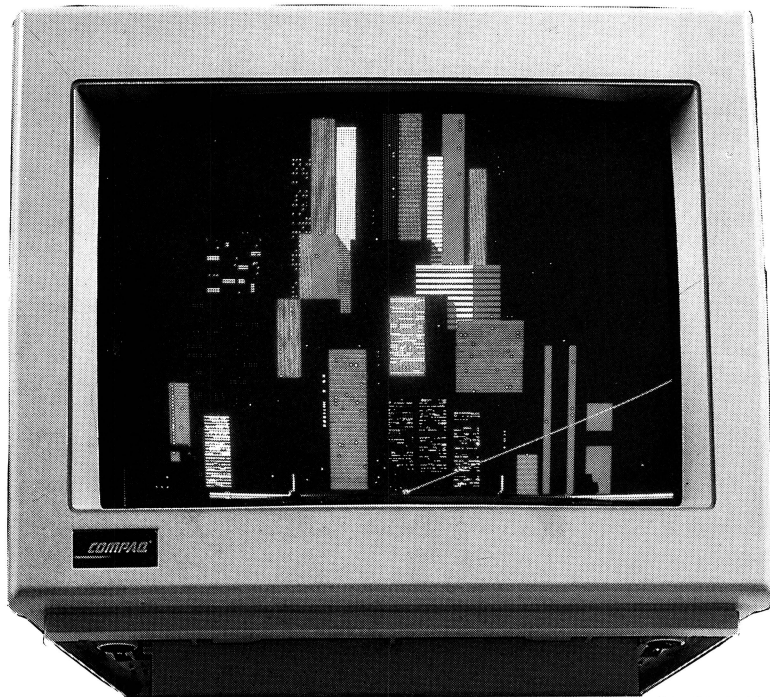
sound generation packages for the Amiga are so sophisticated that they are being used commercially in television production facilities.

Commodore gave the Amiga its power by using separate processors for the different functions, allowing more tasks without appreciable delays. The main criticism levelled at the machine was its lack of a hard disk; this has now been corrected in the latest version. And, 'serious users' criticise disk access speed while using the 3 1/2 inch drive. Processing speed, on the other hand, is more than adequate for everybody.

The judges had no hesitation in including the Commodore Amiga amongst the finalists for the awards because of its technical excellence. This machine is a milestone in the development of the personal computer.

(If you want to know more about the potential of this machine, don't miss our monthly 'Your Amiga' column starting in this issue). □

Compaq 386



The manufacturer of IBM-compatible machines most admired by its competitors is Compaq Computer Corporation. The name Compaq comes from COMPATibility and Quality and the company has an enviable reputation for just those two things.

MANY SOFTWARE suppliers label their products as being for IBM and Compaq, indicating almost total compatibility, and one look inside a Compaq machine will indicate top quality design and manufacturing.

Compaq got its start by opening up a new market segment — IBM-compatible portable computers, and was so successful that when IBM entered the segment it found it impossible to knock Compaq off. Later, seeking to expand, the company took IBM on with a range of desktop machines, the DeskPro family. Based on the 8086 processor, these machines offered higher performance and better expansion (especially hard disk and tape backup unit) capability than the competition.

Compaq continued to expand its line with the introduction of the 286 Portable, the Portable II (also based on an 80286) and the Deskpro 286 line. However, throughout this period of development, the accent has been on following in IBM's footsteps and maintaining compatibility.

With the Deskpro 386, however, Compaq has adroitly stepped past IBM in releasing a machine with a new architecture before the jolly blue giant. This is, from some perspectives, a slightly risky endeavour. IBM is almost certain to release a machine based on the 80386 processor this year, and when it does, will it create a new industry standard, leaving Compaq high and dry? Probably not, we would have to say.

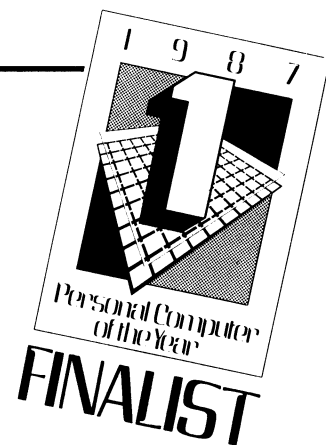
The 80386 is an elegantly engineered machine which manages to combine brand new, high performance technology with the ability to run existing software and use existing expansion cards. This is no mean feat. The 80386 processor is a true 32-bit device, unlike the earlier 8088 (16-bit inside, eight outside) and 80286 (16-bit throughout), and for best performance memory should be 32 bits wide also. Compaq's engineers had to decide between building in a 32-bit bus which would be incompatible with earlier machines or crippling the machine with a 16-bit wide bus.

Sensibly, they compromised. The machine has a high-speed (16 MHz) 36-bit memory bus (32 bits of data plus 4 error detection bits) for maximum performance on memory access, and up to 10 Mbytes of memory can be inserted on this bus. The machine also has seven expansion slots on an 8 MHz I/O bus. Three of these are 8-bit PC-type slots (two long, one short), while the other four are AT-style 16-bit slots. Two of the slots are occupied by the Compaq Enhanced Colour Graphics Board and the Multipurpose Fixed Disk Controller, which also carries the floppy controller, serial and parallel ports, as well as a tape drive interface.

The combination of a 32-bit memory bus with a conventional AT-style expansion bus provides high performance (very high performance) together with the ability to plug in peripherals *now*, rather than as they slowly become available. The decision to run the expansion bus at 8 MHz is also correct; some AT machines have difficulty running certain expansion boards at higher speeds. The result is a machine that works excellently and is usable now.

The 80386 processor used in the DeskPro 386 is a very impressive piece of sand. It actually comprises six separate processors (the 8088 was two, the 80286 four), all running simultaneously and performing tasks like pre-fetching instructions before they are required and decoding them and perfecting the required data before the execution unit needs it. The result is a processor that can execute between three and four million instructions per second, which puts it in the range of what are commonly accepted as superminicomputers.

The 386 processor can address 4 gigabytes (4,300 Mbytes) of main memory directly, but is actually intended to run in protected virtual memory mode, in which programs can refer to addresses anywhere in a range of 64 Terabytes (approximately 70,000,000 Mbytes). Like the earlier Intel processors, it uses a segmented architecture, but granularity is variable and so segments are not restricted to 64 Kbytes but can be up to 4 Gbytes in size with 4 Kbyte pages.



The front of the machine comprises a key lock to the right of the logo, with a plug for the keyboard at the bottom left of the first section. The central compartment holds the A: 1.2 Mbyte drive on the top with the D: 40 Mbyte tape backup underneath. The right hand compartment features either a 1.2 Mbyte or 360 Kbyte drive in the B: drive at the top, with the 40 Mbyte C: fixed drive underneath.

The Deskpro 386 has seven expansion slots on an 8 MHz I/O bus. Three of these are 8-bit PC-type slots and the other four are AT-style 16-bit slots. Two of the slots are occupied by the Compaq Enhanced Colour Graphics Board and the Multipurpose Fixed Disk Controller.

This virtual memory scheme means that programs can be written which are limited, not by main memory, but by disk storage (in effect, with the addition of a suitable operating system, it treats disk storage as part of main memory).

The big problem is developing suitable operating systems, and the availability of the Compaq DeskPro 386 means that many companies will now be able to start development (some are already finished: Digital Research has announced a version of Concurrent DOS for the Compaq). Chief among the operating system developers must be Microsoft, who are already shipping the 80286 version of Xenix for this machine, together with the Xenix System V/386 Development Toolkit which comprises 80386 versions of the C compiler, assembler, a debugger and kernel support for 80386 programs.

Other suppliers are working on the problem: MicroPort Inc. already has a product called Merge 286 which runs MS-DOS as a subtask under their Unix System V/AT, and a 386 version should be available by the time you read this. Phoenix Technologies is co-operating with Microsoft on the development of a product which is similar.

A fast processor requires fast disk support, or it will simply be idling most of the time. The DeskPro 386 supports either a 40 Mbyte drive with sub-30 μ s access times, or a 130 Mbyte drive, with 25 μ s access time. These, almost as much as the

80386, contribute to making the machine especially fast. The results of our dBASE benchmark are shown in Table 1.

These results indicate two things: a) this machine is bloody fast! and b) the processor is spending a lot of its time waiting for the disk drive. This conclusion is borne out by a subsequent test, in which we ran the FACES program, which puts randomly-moving faces on the screen while continuing to run DOS software in foreground. With 50 faces on the screen, which tends to drag PC's into the ground, the DeskPro 386 took only three seconds more to complete Stage 1, indicating that the processor really had nothing better to do. $\square$

Stage 1 - file create	25.90
Stage 2 - index	25.88
Stage 3 - delete and pack	30.81
Total	82.59

Table 1. Dbase Benchmarks for the Compaq Deskpro 386.

Product Details

Product:	Deskpro 386
Made By:	Compaq Computer Corp.
Review Machine from:	Compaq Computers Australia Ltd, 100 Harris St, Ultimo 2007 NSW (02) 660 0077
Processor:	Intel 80386
Clock Speed:	16 MHz
RAM:	1 Mbyte
ROM:	16 Kbyte
I/O:	Serial and parallel ports
Languages:	Any and all MS-DOS, Xenix
Keyboard:	AT-style
Display:	Choice of monochrome or colour
Graphics:	720 x 350 mono, 640 x 350 colour
Peripherals:	You name it
Expansion:	7 slots IBM PC/AT compatible (see text)
Options:	80287-8, 130 Mbyte drive
Price:	Model 40, \$14,250 taxed Model 70, \$16,050 Model 130, \$18,950 Colour graphics board and monitor are available for \$1,397 each

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A generous 132 watts of power for even the most demanding hard drive.

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Dual IBM-compatible floppy disk drives standard or slide in the drive of your choice.

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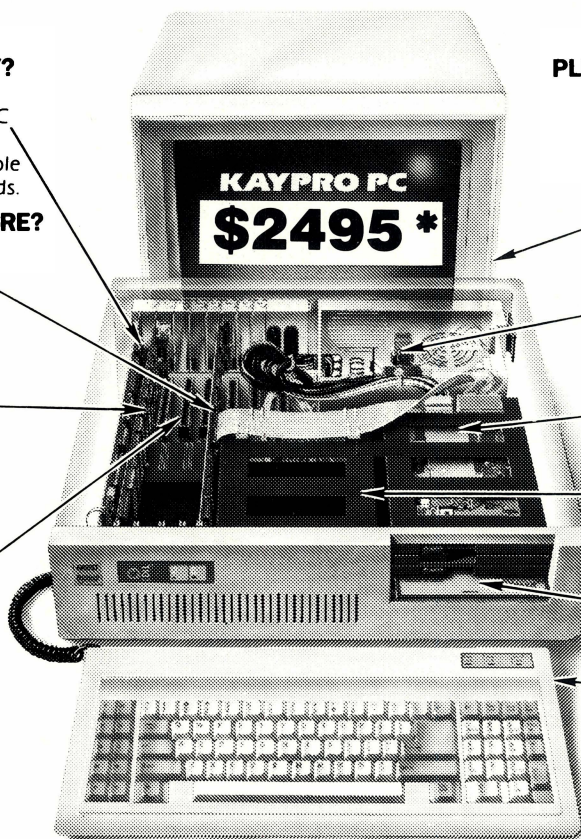
Space provided for easy addition of internal hard drives.

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A full selection of business software for today and tomorrow.

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Detachable, IBM PC AT-style keyboard with security keylock.



Kaypro's new "Snap-In" technology lets you exchange or update all vital system components in seconds.

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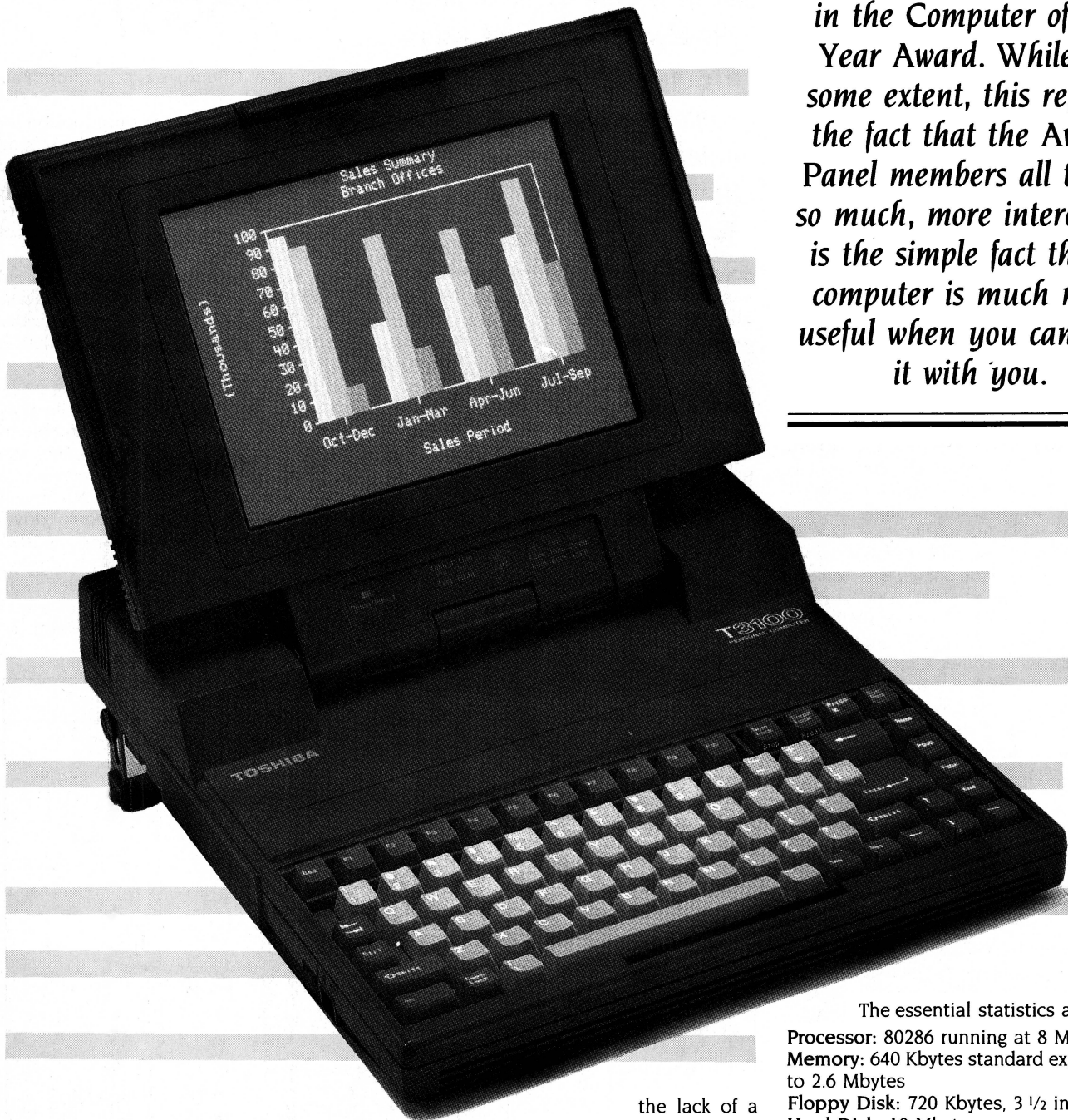
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Toshiba T3100

In previous years, portable computers have scored well in the Computer of the Year Award. While, to some extent, this reflects the fact that the Award Panel members all travel so much, more interesting is the simple fact that a computer is much more useful when you can take it with you.



IN PREVIOUS YEARS, we have accepted that selecting a portable computer meant some kind of trade-off or sacrifice of performance or features: a small or hard-to-read screen, perhaps, or

the lack of a hard disk. In the Toshiba T3100, however, we have come across a portable which does not require sacrifice.

The 3100 is a superbly engineered unit, which meets or exceeds the specifications of the bulk of desk-top computers.

The essential statistics are these:

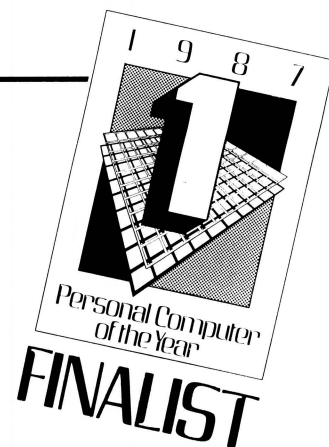
Processor: 80286 running at 8 MHz,
Memory: 640 Kbytes standard expendable to 2.6 Mbytes

Floppy Disk: 720 Kbytes, 3 1/2 inch,

Hard Disk: 10 Mbytes,

Display: Plasma Discharge Type, 640 x 400 resolution.

In short, the 3100 does not lack in performance. Its 80286 processor makes it an AT clone, rather than an XT clone, and it



While the 3100 does not run from batteries, this doesn't seem to be a major disadvantage; most users are not looking for a field portable so much as a 'hotel room' computer, and the 3100 meets this need very well, indeed.

also gives it the ability to run software significantly faster than the majority of desktops, let alone laptops.

The 3 1/2 inch internal floppy disk drive is supplemented by an optional external 1.2 Mbyte 5 1/4 inch drive, which can be used to install software, or for use on the desktop. When travelling, however, the 3 1/2 inch drive is more than adequate for backups and off-line storage, and the robustness of these disks means that they can be simply thrown into a briefcase or suitcase.

The 81-key keyboard has a slightly more compact layout than a desktop machine. The numeric pad is overlayed onto the qwerty area of the keyboard, and is essentially not usable, but separate cursor keys are provided. An optional external numeric pad is available for those who need it. The keyboard has an excellent feel.

The 3100's plasma discharge display is superb. It's contrasty and readable over a wide range of viewing angles and lighting conditions, and it is always perfectly focussed, unlike a CRT display. While the display has 640 x 400 resolution, most software treats it as a PC Colour Graphics Adapter with 640 x 200 resolution. GWBASIC, however, drives it to the full resolution, and drivers could be constructed for other popular packages like Lotus and Framework.

An RGB colour output is provided on the back of the machine, although, annoyingly, the plasma display is disabled when the CGA output is turned on. It would be nice to have both, especially since the plasma display cannot be moved out of the way.

Also on the back of the unit are a serial port and a parallel port, which is also the attachment point for the external 5 1/4 inch floppy. A blank metal panel covers the two expansion slots: one accepts a 2 Mbyte memory board, while the other is for an integrated modem, which is currently under development to meet Telecom requirements.

Currently, the 3100 supports a 10 Mbyte disk, though 20 Mbyte and 40 Mbyte units are rumoured to be on the way. The trouble is that the 3100 tends to displace one's desktop machine and is not user-

While the 3100 does not run from batteries, this doesn't seem to be a major disadvantage; most users are not looking for a field portable so much as a 'hotel room' computer, and the 3100 meets this need very well, indeed. You can tell that battery operation is a no-no by feeling the temperature of the air blown out of the back of the machine by the cooling fan!

For those who need to run special I/O cards, a five-slot expansion unit is available. This will allow you to run the machine on a network, add 3270 emulation cards and so on.

There are very few compatibility problems with this machine: about the only piece of software we haven't been able to run on it is Flight Simulator, because the copy protection makes it impossible to transfer to a small floppy — but it will probably run on the larger, external drive. Everything else (dBASE II, III+, Framework, Lotus, TopView, Sidekick, Word Perfect, Microsoft Word) works as advertised.

In short, an excellent machine; a real workhorse that goes where the work is, and an engineering *tour de force*. □

Product Details

Product:	Toshiba T3100
Made By:	Toshiba Corporation Ltd Pty.
Review Machine from:	Toshiba (Australia) Pty Ltd, 92 Talavera Rd, North Ryde 2113 NSW (02) 887 3322
Processor:	Intel 80286
Clock Speed:	8 MHz
RAM:	640 Kbyte
ROM:	Bootstrap and some diagnostics
I/O:	One serial and parallel/floppy disk port
Languages:	Any and all MS-DOS, BASICA, (GWBASIC) supplied
Keyboard:	81-key qwerty
Display:	80 x 25 gas plasma display
Graphics:	640 x 400
Peripherals:	External 5 1/4 360 Kbyte drive, parallel and nine pin serial ports for printers, a mono or colour RGB monitor, numeric keypad and 2 Mbyte RAM card
Expansion:	2.6 Mbyte memory, five-slot expansion chassis
Options:	Numeric keypad, expansion chassis, memory, modem
Price:	\$8,900 taxed (includes carry case)

The Wang Portable PC

'Not another portable?' did you say? Well, yes and no.

The Wang is indeed a lap-type portable and there are plenty of those around — but this one really is different.



To complete their 'portable office' Wang has included an 80 column, Epson compatible printer in the portable. This thermal printer is no GT, having a speed of only 18 cps (characters per second), but the quality and convenience more than compensate for this. The printer be used either with plain paper and a thermal ribbon, or with thermal paper and no ribbon. Roll paper can be used if this is more convenient.

In the past, Wang has marketed an IBM compatible while still retaining full Wangness, so the Panel were not too surprised to find that the portable is still a hybrid — and to a certain extent, a compromise. Wang PCs have a quite different keyboard usage and layout when compared to other

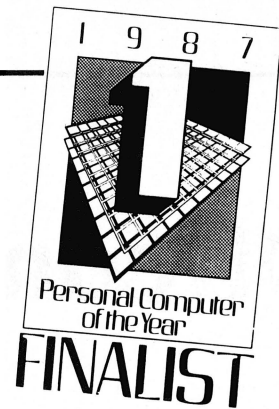
machines and this necessitates a number of cryptic legends on quite a few of the portable's key caps. While all IBM functions are available, users new to this machine will curse more than a few times before they 'get used to it.'

The keyboard is not the only area affected by having one foot in the Wang camp and the other in IBM's. The Wang philosophy is to arrange all functions in a series of menus. This is how the portable boots up — into the familiar Wang menu structure. IBM applications can be run but the 'system mode' must first be changed using the SYSMODE command with parameters for colour, monochrome, and so on. This can be included in the menu structure, however, so it should be invisible to the user once it's installed. We had no trouble running all common PC applications, although experience tells us that it is likely there are packages which will not run on the Wang.

One surprise in this generally well-thought machine, is the absence of an integral floppy drive. Both 5 1/4 and 3 1/2 inch drives are available as battery powered external devices. The logic for this can readily be seen: Once the applications and data are loaded onto the hard disk, floppies would only be needed for backup and data or application exchange. This makes the portable an ideal adjunct to a Wang network, as it could perform all tasks on the network and then download the latest data in preparation for field use by, say, insurance reps.

The screen operates in either 320 x 200 or 640 x 200 modes and is an LCD — readability is average for this type of display. At less than 7 kg including batteries and printer, the Wang is a true portable. Even the stylish carry case only adds another 910 grams. Even the accessories come in a matching, add-on bag.

The Wang portable PC was chosen as a Finalist because it uses appropriate technology and design to produce a functional unit, that is different to anything else on the market. For the IBM compatible user, the Wang features will be superfluous but that in no way affects the functionality and power of this excellently engineered product. □



FIRST, THIS IS is a true portable workhorse. It has the mobility of battery-power coupled with the capacity of a 10 Mbyte hard disk. While many manufacturers have said they couldn't offer such features in a portable because it was just not possible, Wang has done it. They've used what they describe as a 'low power' Winchester. This appears to save power by turning off when not being accessed.

As another power saver, the Wang uses a CMOS 8086-compatible processor which runs at a healthy 8 MHz. Benchmarks show that it is considerably faster than an IBM PC, which runs at 4.77 MHz, of course.

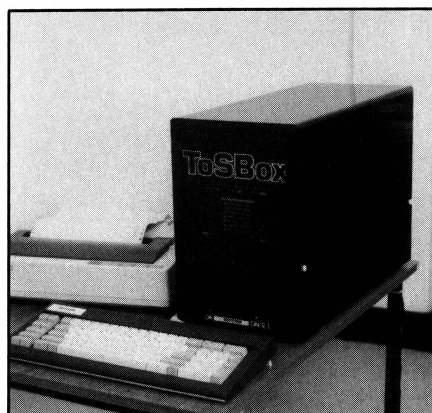
Product Details

Product:	Wang Portable
Made By:	Wang
Review Machine from:	Wang Computer Corp 168 Walker Street, North Sydney 2060 NSW (02) 925 5678
Processor:	NEC V30 8086
Clock Speed:	8 MHz
RAM:	512 Kbyte, 10 Mbyte hard disk
ROM:	8 Kbyte
I/O:	One serial port, keyboard, Wang mouse port
Languages:	MS-DOS 3.2, GWBASIC
Keyboard:	Modified IBM standard, numeric keyboard
Display:	LCD (Liquid Crystal Display)
Graphics:	Screen has a contrast ratio of 7:1
Peripherals:	Builtin printer, external floppy drives for 3 1/2 or 5 1/4 inch drives, an internal modem, an additional CGA monitor
Expansion:	External disk drives
Price:	\$5220 taxed

Offcomm's Tosbox



Tosbox is a communications system, complete with its own PC and printer, that gives electronic ease to the traditionally cumbersome methods of sending telexes.



TOSBOX IS SYSTEM controlling communications, telex-based communications in particular. The system consists of two parts — the software which is the Telex Operating System (TOS) and the hardware (the box) which is a repackaged IBM PC. The PC is configured with sufficient storage to allow it to operate as an unattended telex station.

Traditionally, telex stations have been supplied by Telecom. The requirements were well set down. For example, the station must be able to receive all messages unattended, or, where prevented by problems such as lack of paper or an internal fault, must tell the telex network — this

allows delivery of the message to be guaranteed. This last point is important as delivery by telex is considered as certain delivery under some laws.

When its receiving, a standard telex terminal is only a printer, so there's little to go wrong: either the printer works or it doesn't — the system is extremely reliable. This is where the problem lies for PC-based telex systems. Because the equipment is more complex and there are more steps where things can go wrong, Telecom feels that a back-up is required. The result of this is that Tosbox comes complete with a printer which automati-

cally echoes all traffic.

It should be noted here that Tosbox has not yet been approved for connection to the telex network without the connection of a Telecom approved telex terminal in parallel.

The real intent of the system, of course, is to electronically handle all text. Outgoing telexes need no longer be re-entered at the telex keyboard despite their (probably) having been electronically stored already. With Tosbox, the telex can be generated anywhere on a network, or where communications exist to connect to the system. This means that the number of telex nodes needed by an organisation can be drastically reduced. As the TOS system also supports other sorts of communications such as dial-up modems for PC to PC and mainframe to PC communications, one Tosbox can be used to connect an entire network and associated remote PCs to the public telex network.

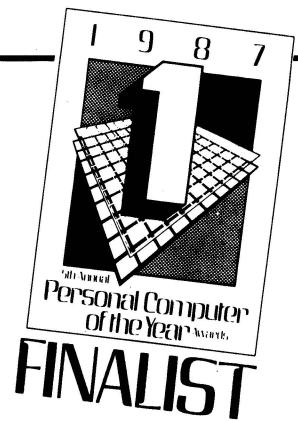
In practise, TOS will recognise codes embedded in a telex which will cause the system to automatically dial a remote PC and transfer the telex to it. OffComm say that they have a number of international users of their machines who use them to overcome excessive local telex charges in certain countries. The machines act first as local store and forward terminals, collecting messages over a period of time and then they are accessed by another system overseas which transfers the traffic to the telex network.

Other features which make Tosbox such a money and time saver include delayed transmission, auto-retry and broadcast calls. The delayed transmission allows non-urgent traffic to be kept until periods of low tariff. The auto-retry allows the system to repeatedly cycle through its undelivered traffic, retrying until all messages have been delivered. Broadcast calls may be made either by using the powerful features already offered by Telecom or by Tosbox itself — the system can send one message to a number of recipients, either via the telex network or by other communications systems.

The Panel thought Tosbox was a well-designed, technologically-advanced, marketable business product with a definite capacity to attract export orders. □

Product Details

Product:	Tosbox
Made By:	Offcomm
Review Product from:	Offcomm
	28 Chandos Street, St Leonards 2065 NSW (02) 438 4199
Processor:	8088
Clock Speed:	4.7 MHz
RAM:	640 Kbytes
ROM:	Phoenix style
I/O:	Parallel, serial, telex, monitor, keyboard
Languages:	A specialised communications language
Keyboard:	IBM XT-style
Display:	A 9 inch monochrome
Graphics:	80 by 24 lines
Peripherals:	Printer, monitor, modem.
Expansion:	Internal 10 or 20 Mbyte hard disk and internal 5 1/4 inch, 360 Kbyte disk floppy disk drive
Price:	10 Mbyte model \$8500 taxed; 20 Mbyte \$8,800 taxed



Earth Computer's ECS 286 PC

The heart of the ECS 286 PC is a motherboard designed from the ground up to give a computer that is right behind the sheer processing power of the latest 32-bit machines. This is unashamedly an XT-compatible — we can hardly wait for ECS' version of an AT!



AT FIRST GLANCE it would seem that this is just one more Taiwanese clone, with the difference that it's assembled in Australia. While ECS' 286 may be based on a number of imported components, the heart of the machine is the motherboard, built and (more importantly) designed in Australia. Rather than use just another Asian turbo-board — they're two-a-penny now, and they could all come from the same mould — ECS has designed this processor board from the ground up, ending up with a finished product that is 'merely' an XT compatible on one hand, yet on the other hand, it is second only to the Compaq 386 in sheer processing power as our Benchmark runs showed. (See Matt Whelan's *At Last! AT Best in YC, Jan '87*)

Even then, ECS could have just used the 80286 at high speed and left the memory and co-processor operating at lower speeds — and saved themselves some money. Luckily for the purchasers of this machine, no expense has been spared

and all aspects, including the hard disk speed, are matched to optimise performance.

A very big plus in an IBM compatible PC

is standardisation. All too many manufacturers have had a go at perfecting the wheel and while the result may be rounder than the original, there's no guarantee it'll ►



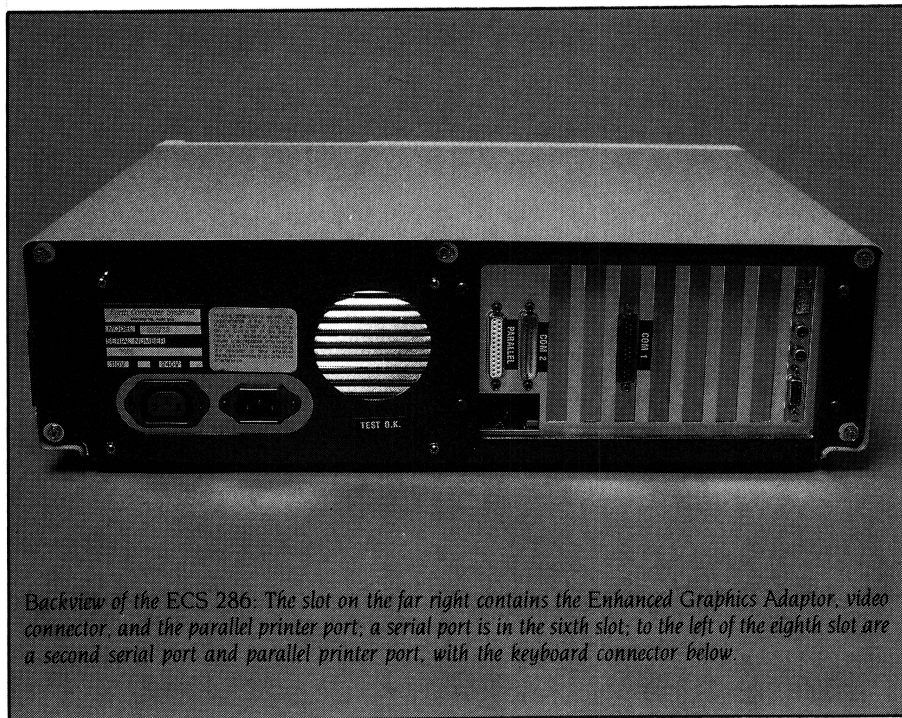
fit — many of these offerings are (at least) partially incompatible with the standard they measure themselves by. Low profile enclosures make look pleasing, but if they don't take any standard expansion cards they are functional cripples to most users.

Despite the processor being an 80286, this machine is *not* an AT and should *not* be thought of as such: It is unashamedly an XT compatible. Anyone trying to run Flight Simulator on this 286 had better be good at landing a biplane at apparent speeds of hundreds of knots — we know because we tried! We hope to see what ECS will call an AT in the near future — or imagine a 386-based machine with this same level of development!

Despite its obvious role as a power PC or network file server (a field generally left to computers costing \$15- to \$20,000), this is quite an inexpensive machine. While it may have competition from the Asian Turbo Brigade (*only* in price), none of them come close in performance.

Although ECS recommend an EGA card and monitor, the 286 PC is offered without either since many of the end users are applying it to CAD or desktop publishing — for both of which it's eminently well-suited — and require even higher resolution combinations.

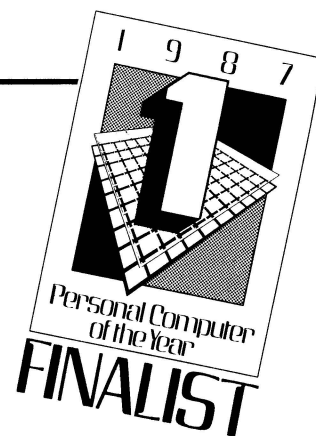
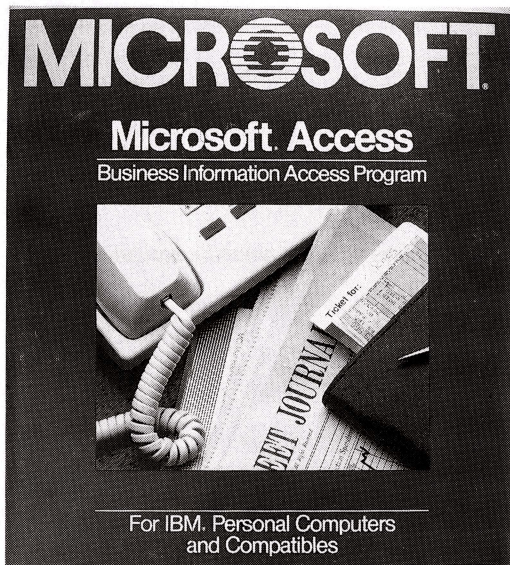
Why did the Panel choose the ECS 286 as a finalist? All of the power arguments aside, it's simply because Earth Computers designed and are manufacturing a very high performance PC, at a reasonable price. The fact that this is an Australian product merely adds to the respect shown for it. The many users canvassed by the Panel, had unanimous praise for the power, reliability and support of this product. □



Backview of the ECS 286: The slot on the far right contains the Enhanced Graphics Adaptor, video connector, and the parallel printer port; a serial port is in the sixth slot; to the left of the eighth slot are a second serial port and parallel printer port, with the keyboard connector below.

Product Details

Product:	ECS 286 PC
Made By:	Earth Computer Systems 2/15 Brisbane St, Eltham 3095 Vic (03) 439 4900
Review Machine from:	Earth Computer Systems
Processor:	80286
Clock Speed:	12.5 MHz
RAM:	640 Kbyte, dual-banked interleaved, no-wait state
ROM:	8 Kbyte BIOS, Bootstrap, Diagnostics
I/O:	2 programmable, 9600 baud RS232C ports
Languages:	DOS3.2, GWBASIC
Keyboard:	84-key, AT-style
Display:	640 x 350 pixel monochrome with Hercules-type graphics card; 640 x 350 with EGA, 16 colours; 13-inch, 640 x 480, 16 colours with Verticom graphics controller; 15-inch, 1024 x 768, 16 colours, with Verticom graphics controller, 3 modes.
Peripherals:	60 Mbyte streaming tape backup unit, 120 and 280 cps printers, digitised plotter for CAD/CAM work.
Expansion:	5 slots, Extended Memory Module (2 ports), giving 8 Mbyte
Options:	network server, 80287 maths co-processor
Price:	\$9,995 plus tax for standard unit



Microsoft Access

Developed by the US Tymnet network, X.PC is designed specifically for packet-switched network operation, and assembles all communications into packets which are routed to the appropriate machines at the ends of the link.

COMMUNICATIONS AND computers is not really a recent combination. Since the days of the earliest computers, terminals have been installed remotely, and cables or modems used to link them to the computer.

In 1976, Ward Christensen and Randy Suess, members of the Chicago Area Computer Hobbyist Exchange (CACHE), set up a remotely accessible computer system, and Ward wrote a program which would allow the group's members to use their computers as terminals and access the system — thus we had the world's first bulletin board.

Since then, the use of personal computers to access a variety of communications services and databases has boomed. The simple 'glass teletype' terminal emulation and simple file transfer protocol of Ward Christensen's original MODEM7 program is no longer adequate to meet the needs of today's users.

Generally, users fall into two categories — The first category is those who have long-experience accessing bulletin boards, transferring files to other users, and setting up their machines for unat-

tended operation. This group needs sophisticated facilities for driving Hayes-compatible modems, sophisticated file transfer capabilities, and macro programming to eliminate unnecessary key-stroking.

The second group are the business and neophyte users who find communications software, with all the attendant talk of

word lengths, parity, ring detect and so on, simply *too* confusing. This group wants menu-driven software which can be set up by a technical staffer at work or a hacker friend at home.

Microsoft Access meets the needs of the two groups remarkably well. For the first group, there's not just macros but virtually a full programming language called

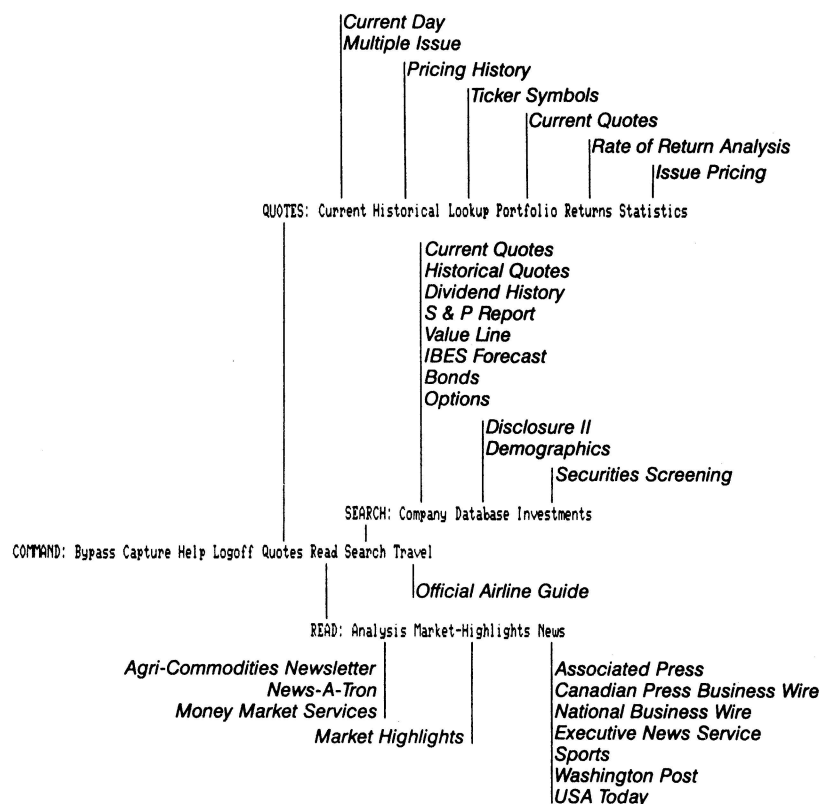


Figure 1. Microsoft Access includes a number of customised menus for various databases and services. Commands from these menus are translated by Access into commands appropriate to the remote host computer. The Compuserve Custom Menu is illustrated above with the translation of that service's database shown in italic type.

MASC (Microsoft Access Script Command language). MASC is reminiscent of BASIC; it includes statements like FOR..NEXT, IF..THEN..ELSE and others. However, it also contains commands which are specifically designed for communications, modem control and timing. With MASC, you can write short programs which will wait until 3 am, dial up your favourite bulletin board, and download the public domain software you want.

Naturally, Access supports the Christensen (also known as XMODEM) protocol for file transfer, and can capture (and send) text files with no error-correction protocol. However, it also supports the X.PC protocol, which is not truly a file transfer protocol, but is rather a session-level protocol. When transferring files, the Christensen protocol performs error detection and correction, but when you are simply logged onto a remote database system, there is no error detection going on, and occasionally characters get corrupted.

X.PC takes care of this problem. Designed by the US Tymnet network, X.PC is designed specifically for packet-switched network operation, and assembles all communications into packets which are routed to the appropriate machines at the ends of the link. In fact, Microsoft Access, using X.PC, allows you to have simultaneous sessions with up to eight hosts, provided that the physical connection to the network is through one modem.

For the novice user, Access also makes all of this quite comprehensible. Access is menu-driven, using the same menu style as Word and Multiplan, Microsoft's other products in this line. However, it is possible for users to deal not only with the Access program through these menus, but also with the remote computer. Access provides a set of customised menus, aimed primarily at US customers who want to look up financial and stock market information on services such as CompuServe. Some of these are of limited use to Australian purchasers, but the idea is certainly nice, and given time.

Of course, it is possible to develop your own menus, if you have the Access Custom Menu Developer's Kit. A menu system actually comprises a menu file and a script file, and the Kit allows the user to compile the menus.

The idea behind all of this is that an experienced communications user (such as corporate PC support staff) can set up turn-key systems for complete novice end-

FOR and NEXT Statements

FOR *indexvariable* = *begin* TO *end* [STEP *step*]

NEXT

Use to execute a group of script statements a number of times in a loop.

Indexvariable is an integer variable used as a counter.

Begin, *end*, and *step* are integer expressions.

Access sets the counter to *begin*, initially. When it encounters the NEXT statement, it adds *step* to the counter and compares the counter to the *end* value. If the counter is greater than *end*, the loop terminates and processing resumes with the statement following the NEXT statement; otherwise, Access repeats the loop. When Access encounters the FOR statement and the *begin* value is greater than the *end* value, it omits the loop.

If the *step* value is negative, Access reverses the test. The loop continues until *indexvariable* is less than the *end* value.

When using FOR-NEXT loops, you can nest FOR-NEXT loops by using different index variables as counters. You cannot reuse index variable names within nested FOR-NEXT statements. Every FOR must have a corresponding NEXT.

Figure 2. For experienced users, Access not only offers macros, but virtually a full programming language of its own called MASC (Microsoft Access Script Command language). MASC is reminiscent of Basic, as can be seen in this page from the Access manual.

users. Of course, things can still go wrong, but most of the time, operation will be much simpler and faster.

Access contains lots of other nice features. For example, it incorporates a rudimentary electronic mail system which lets you compose mail messages off-line, using the Notepad editor which is part of the package, and then despatch it automatically. Again, the systems supported are both in the US, but give it time. . . .

Access can also support two modems simultaneously in two windows.

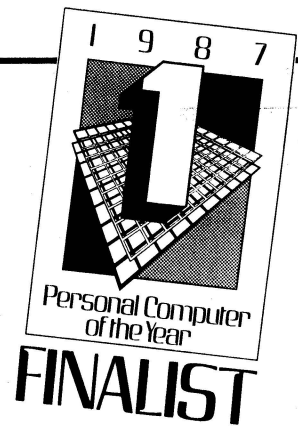
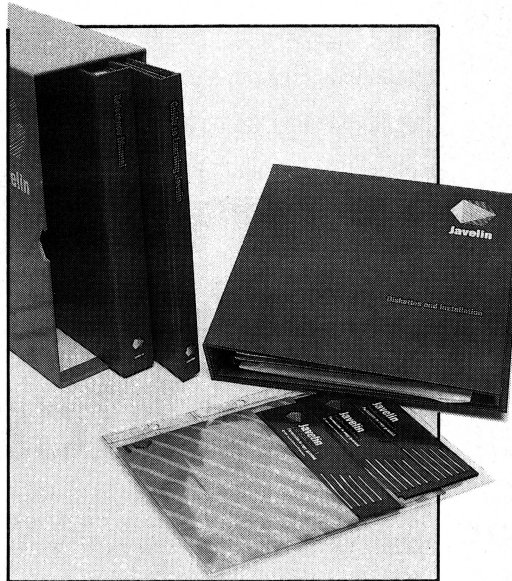
All of these features, coupled with a sensible user interface, will do a lot to make Access the standard communications program for many users. Comms gurus will love its advanced features, and as X.PC becomes more prevalent, this program will be hard to live without. Overall, Access is a well-designed, thoroughly thought-out program. □

Product Details

Program:	Microsoft Access
Made By:	Microsoft
Review Copy from:	Microsoft Australia, Unit 1, 17 Rodborough Road, Frenchs Forest 2086 NSW (02) 452 5088
Useful for:	Communications access to remote computers
Hardware Req'd:	IBM PC or compatible, 256 Kbytes memory
Extras included:	Various pre-configured menus and script files
Options:	Menu developer's kit
Price:	\$475.00 plus tax

Javelin

Javelin is a full-featured business analysis and reporting package which takes full advantage of today's powerful PCs — it's unfortunate that it's often referred to as a 'spreadsheet' when it has so much more to offer.



SOME SAY THAT an actor's greatest fear is being type-cast. The same could be said of business software: packages that don't really fit into a familiar category are type-cast by the PC community for convenience. As a result, the actual potential of the software is overlooked. Industry observers feel that Javelin has suffered exactly this problem. It's usually cast as a spreadsheet when compared with other products; while it does have similarities to traditional spreadsheets, to consider only that aspect is to ignore the greater part of the product's power.

Javelin is a way of relating data which allows those relationships to be traced and fine-tuned. There are 10 'views' which show how the data interact. These are —

Diagram View shows schematically how the variables relate;

Formulas View shows the position of a formula against all others;

Table View shows a table of values for one variable;

Chart View gives a dynamic bar chart which may be used for data 'tuning';

Quick Graph gives a line version of Chart View;

Worksheet View is the traditional spreadsheet view;

Graph View offers presentation graphs in seven styles;

Notes View for comments or assumption entries;

Errors View gives a log of errors and inconsistencies; and

Macro View is used to create and modify batched commands.

One feature of Javelin which has received much praise is its recognition of time and time delays. This reflects the real world where accounts received will lag invoicing by a predictable amount. Another feature is the ability to address all variables by name rather than co-ordinates. Thus, 'Jim salary' and 'Salary Jim' are the same thing to Javelin.

Javelin embodies many of the sort of features which we will soon expect of all packages. For instance, the 'spell' key allows the user to find a worksheet, macro, variable or any other Javelin feature with the input of just part of the name. Javelin then either completes the word or gives all matching possibilities for selection.

The Panel chose Javelin as PCOTY finalist because it embodies truly new features and reflects the next generation of user-helpful software. It's a full-featured business analysis and reporting package which takes full advantage of today's powerful PCs.

POSSIBILITIES

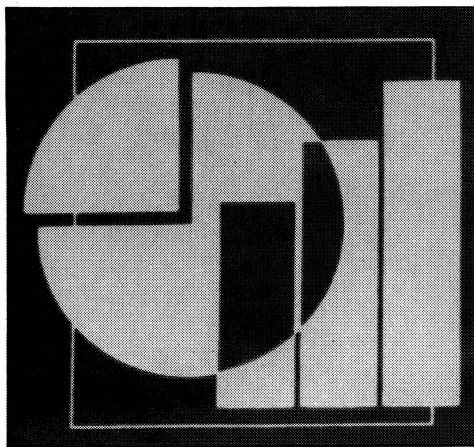
Change in Cash
 Denver Profits
 Denver Sales
 Los Angeles Profits
 Los Angeles Sales
 New York Profits
 New York Sales
 Sources of Cash
 Uses of Cash

When the SPELL key (TAB on a PC keyboard) is pressed, Javelin will show the previously defined variables in the current model that match what has been typed. If there is only one choice, it automatically enters it in the text; if there is no match, it beeps.

It incorporates important business features such as automatic error detection and intuitive application building. □

Product Details

Program:	Javelin
Made By:	Javelin Software
Review Copy from:	Sourceware 586 Pacific H'way, Chatswood 2067 NSW (02) 411 5711
Useful for:	serious business analysis and communication
Requires:	512 Kbyte RAM, DOS 2.0 or later, two floppy drives
Extras included:	A demonstration disk with three case studies written in Javelin
Price:	\$469 taxed



Harvard Presentation Graphics

One of the nice features about a well thought-out software package is its ability to be run by a VIU (Very Impatient User!). Harvard Presentation Graphics is just such a package. All commands are intuitive or are supported by concise help messages.

HARVARD PRESENTATION GRAPHICS (HPG) is a graphing package which accepts data from most spreadsheet and database packages and quickly produces a high quality graph. Not only can it drive most printers and plotters but also a Polaroid Palette camera for slide produc-

tion. The package produces on screen slides which can be arranged into a manual or automatic presentation.

While not being as powerful as some top-end products, HPG wins favour by combining high output quality with extreme ease of use. At any time, the graph may be displayed with one keystroke (F2). Standard graph types include two- and three-dimensional pies, bars, lines and so on.

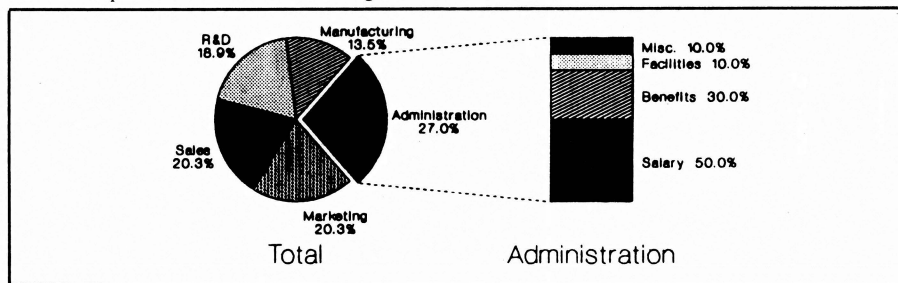
A feature allows simple text or graphics to be added to the chart to add information or impact. The software is designed to

allow the creation of text charts, for overhead transparencies or on-screen slide shows.

First time users, even without reference to what we feel is an excellent manual, can produce graphs within minutes with HPG. On screen previewing of the graph or chart takes seconds. As printing and plotting may be done at three levels of definition, draft plots can be quickly made and even the highest resolution only takes a few minutes with a basic PC.

One useful feature is the ability to link graphs. Graphs can be produced in pairs (pie/pie, bar/bar, or pie/bar) so that a second graph shows a magnified segment of the first. Once the data is correct, a few keystrokes change the output from monochrome to colour, plain to pattern, and 2D to 3D.

We may find that the next version of HPG has a greater emphasis on drawing as a sister product is Harvard's Desktop Publisher.



Product Details

Program:	Harvard Presentation Graphics
Made By:	Software Publishing Corporation Mountain View, California
Review Copy from:	Imagineering Technology 77 Dunning Avenue, Rosebury 2018 NSW (02) 662 4499
Useful for:	Produces graphs, charts and slide shows
Hardware Req'd:	Any IBM PC/XT/AT and compatible machines, Hercules graphics card, an IBM EGA card with 256 Kbytes on the card, an expanded graphics display card and a mouse
Options:	MS-DOS 2.1
Price:	\$833 taxed

HPG has the ability to produce 'linked' graphs, in which a second graph shows a breakdown of a slice of the first. The slices of a graph can be displayed in sorted order (as in the column graph above).

This is an object-oriented package — this approach results in excellent quality output. Object-oriented means that the software uses the maximum definition of the output device to create each piece of graphics. Text quality is amazing when seen for the first time.

HPG impressed the Panel enough to become a Software Finalist by its combination of quality output, extreme ease of use and versatility. Every member of the Panel took this as a good example of business productivity software. □

THE IMPORTERS OF MACE \$195 AND XTREE \$112 INTRODUCE

FORMTOOL

FORMTOOL is the sophisticated software package that allows you to custom make forms, letterheads — all office stationery. With **FORMTOOL** you no longer need costly typesetting, artwork and printing.

The collage shows several sample forms:

- PATIENT HISTORY UPDATE**: Includes fields for Name, Home Address, Home Phone, Bus Address, and Bus Phone. It also has a section for Medical History with two numbered questions.
- AREA SCHEDULE**: A form with a header 'AUSTRALIA'S LARGEST INDEPENDENT OVERNIGHT PARCEL EXPRESS SERVICE' and a table with columns for DATE, TICKET NO., LOCAL, COUNTRY, VIC, SA, and a grid for C, L, T, P, C, L, T, P.
- ORDER FORM**: Includes fields for Dealer (Retail, Govt), Name, Phone No., Invoice Address, Delivery Address, and a section for Payment Method (Bankcard, Visa, Amex, Diners, Mastercard).
- SUB-CONTRACTOR DAILY RETURN**: A form with a header 'EXPRESS PTY. LTD.' and a table with columns for DATE, TIME, QUANTITY, and PICK UPS.

LINE DRAW

Single keystrokes make screen-wide horizontal and vertical lines with perfect intersections, corners, T's, double lines and grids automatically.

MERGE

Fill in form or just specify dBase, DIF or ASCII data files and let FORMTOOL merge data into your new form.

PRINTING

Print your own office forms. Just plug in for use with most dot matrix, laser and injet printers. Sideways printing included.

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Phone (02) 957 6686

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Please send me _____ copies of XTREE, \$112 each.

Please send me _____ copies of FORMTOOL, \$295 each.

I enclose my cheque for \$_____ or please debit my American Express, Diner's Club, Visa, Mastercard or Bankcard plus \$6.50 freight.

Card expires _____ Signature _____

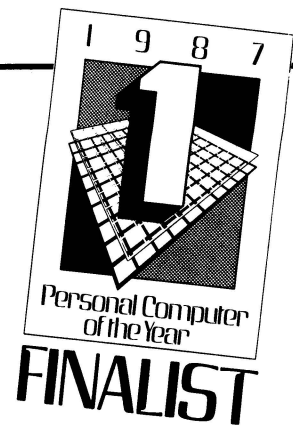
Name _____ Company _____

Address _____

Phone No. _____



Buy Now! Save time & printing costs



DESQview

With DESQview, the 'power user' can run up to nine 545 Mbyte programs at once — and it's a snap to use!

ONE IS OFTEN tempted to wonder whether 'power users' really exist, or whether they are simply a glint in the eyes of the marketing men. On the whole, however, the Panel thinks they *do* exist, simply because they all see themselves fitting readily into that category.

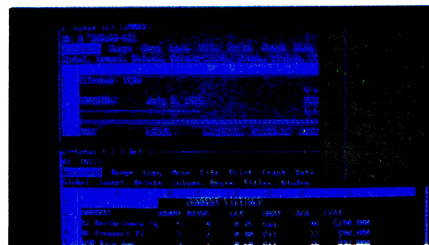
'Power users' have power over the machine, and can make it do what they want; consequently they are always looking for even more power. In particular, the machine is never *quite* fast enough for a power user — even the Compaq 386 is too slow — and a power user's fingers are always poised over the keyboard, waiting for the prompt to reappear.

It is to these users that multitasking operating systems and operating environments appeal. Such systems are able to run several programs at once, so that while dBase is performing a sort (for example) it is still possible to perform other tasks. Of course, the sort will run more slowly, but often that is not a problem; what we really want is to get on with some word processing right *now*.

DESQview is such a system. It is an operating environment; that is, it is really a shell which sits on top of the MS-DOS operating system, or between it and the user.

Whenever a window is opened, DESQview will display a list of possible applications for which it is pre-installed (dBase III Plus, Lotus and others), assuming you have them. Installation is a snack — just tell the install program which disk drives you have and it goes away and copies the appropriate files into the DV subdirectory. It then scans the rest of your disks to see which applications you have that DESQview knows about, and then installs them under DESQview. Very neat indeed.

When we installed DESQview on a machine with dBase III Plus, however, it installed dBase III Version 1.0, dBase III Version 1.1 and dBase III Plus Version 1.0 all on the menu, so it's not completely foolproof. Nevertheless, this is an almost insignificant error.



In operation, DESQview is a snap to use, and offers a high level of compatibility with existing DOS software. It's not as ambitious as, say, Microsoft Windows, but seems to do a better job with existing software which has not been designed specifically for multitasking.

In particular, DESQview is almost completely compatible with TopView, IBM's (near death) multitasking environment. It can use the same .PIF (Program Information Files), although the .DVP files are bet-

ter, and also supports TopView calls by applications programs.

One can hardly look for software which is easier to use. We simply installed it, took a very brief flick through the manual, and started using it immediately — we still haven't read the manual. Surely multitasking environments aren't meant to be this simple?

DESQview incorporates a number of features which will satisfy advanced users. For example, it incorporates a macro facility which allows you to write keystroke scripts and associate them with particular key combinations. This is a tremendous time saver for busy users trying to juggle several programs at the same time.

It also incorporates a very nice 'cut-and-paste' facility which allows the transfer of information from one window to another, with simultaneous reformatting if required.

If you have an EMS (Expanded Memory System) or EEMS (Enhanced EMS) board, DESQview will use the memory on these boards to swap out programs which are not currently required. In particular, the EEMS standard will support more, and larger programs — up to nine 545 Mbyte programs — while the EMS standard only provides a 470 Kbyte program space (the additional space can be used for print spoolers, vdisks and the like).

When running on the Compaq DeskPro 386, DESQview 1.3 has significantly expanded capabilities, thanks to the Virtual 86 Machine architecture of the Compaq: you can run up to nine programs concurrently, all the programs can use extended memory, and each program can be up to 624 Kbytes in size. For example (although we didn't try this!) you could run two communications programs (Novell network and CrossTalk), two copies of Symphony, Paradox, WordPerfect, Ready! and two other programs. If that doesn't satisfy the power users, nothing will!

DESQview is a refined, very capable, product for the serious user who is wondering where all the multi-tasking software for his AT is and wants to get the best use out of an optioned-up machine. It is very simple to use, yet very effective — a disarming combination. □

Product Details

Program:	DESQview
Made By:	QuarterDeck Software Inc
Review Copy from:	Sourceware, 586 Pacific Highway, Chatswood 2067 NSW (02) 411 5711
Useful for:	Doing several things at once
Hardware Required:	PC/XT with 512 Kbyte memory
Price:	\$215 taxed

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for the PC, XT, /AT and Compatibles

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ACCIDENTAL RE-FORMAT OF C:
UNFORMAT will restore all your sub-directories and files automatically on any hard disk.

ACCIDENTALLY ERASED FILE!
UNDELETE gets erased files back with four keystrokes and without cross-linking.

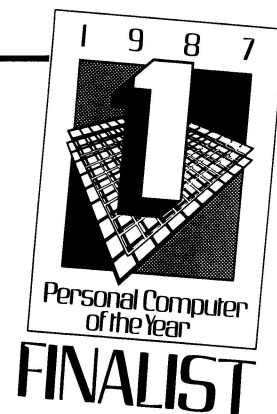
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REMEDY automatically moves files to a safe place and locks out the bad spots.

DAMAGED DISKS
RECLAIM automatically extracts files from unreadable disks.

Optimizes Hard Disk Performance!

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SQUEEZE/SORT in a single operation:
... Speeds up the PATH by squeezing deleted references from directories.
... Sorts your directories on any field.



Mace Plus Utilities

A product doesn't have to be loaded with whizz-bangery to be good value. For example, the features of modest Mace Plus it all but indispensable for every hard disk user — and that's just about every business PC user nowadays.

MACE PLUS IS a collection of utilities designed to make your hard disk use more efficient, and to enable you to survive that most unthinkable of catastrophes: the dreaded hard disk reformat. The disaster recovery utilities also cover the terrifying DELETE *.* scenario.

Once installed, Mace takes periodic snapshots of the directories and file allocation tables, which are overwritten when a reformat is performed. They can be recovered and the disk data, which has not been erased but merely forgotten about, are now magically restored as though nothing has happened — well, not a lot anyway.

There may be some corrupted or lost files if much has been done since the last

snapshot was taken.

The disk management features consist of utilities to make the disk and directories more orderly. The major function has these steps —

- 1) A CHKDSK /F is performed to recover any lost clusters, and release them for use;
- 2) The disk is analysed and bad sectors are locked out;
- 3) All files are moved so that they become continuous (that is, in one piece on the disk).

This is just like a good spring cleaning. It encourages you to run a vacuum cleaner over the disk first, and delete all duplicate or unwanted files before you run Mace. The result for most users is a recovery of many megs of memory and a disk access speed increase for many files of perhaps 30 percent.

The Diagnose function can be useful if you have a suspect hard disk. Mace reads the disk sector by sector and graphically shows any bad sectors that it finds. It will then write a report to disk and print it out showing the errors and their location.

Remedy reads every sector on a hard disk and moves any endangered data to a safe location and then locks out the bad sectors — that's very useful if you've got a deteriorating disk.

Why has the Panel chosen it for the short list? If you have ever felt the anguish of accidentally re-formatted your hard disk, you would not ask! □

Product Details

Program:	Mace Plus
Made By:	Paul Mace Software Ashland, Oregon, USA
Review Copy from:	Software Wholesalers, PO Box 946 Crows Nest 2065 NSW (02) 957 6686
Useful for:	Unformatting, undeleting, condensing, squeezing and sorting hard disk files
Hardware Req'd:	IBM PC/XT/AT or compatibles
Extras included:	Standard manual
Price:	\$153 taxed

PageMaker for the Mac



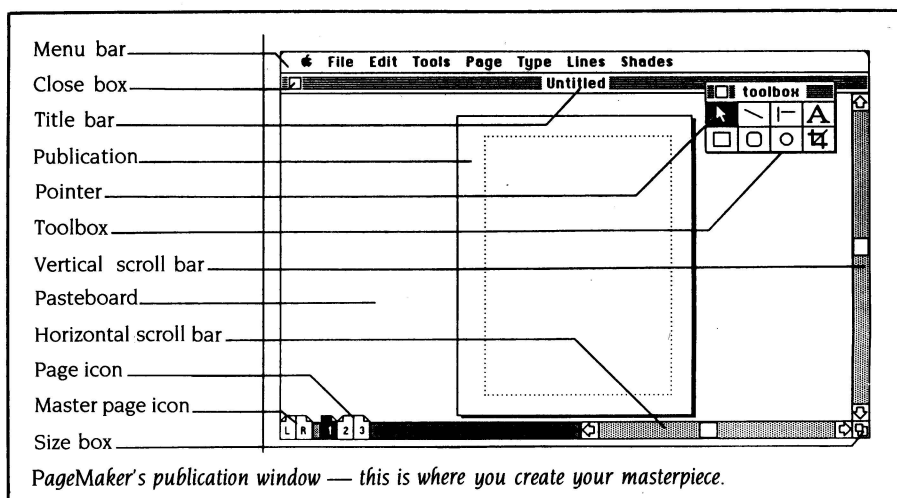
With everyone currently talking about desktop publishing on the IBM PC, it's easy to forget the tremendous lead that the Macintosh and PageMaker have in this area. But we mustn't forget that PageMaker is the package against which all the new-comers are being judged.

SOME USERS WOULD go so far as to say that the Mac is the accessory they use with their copy of PageMaker. (Likewise, the greatest use for laser printers must be desktop publishing.) Because of its hunger for memory, Aldus suggests that the package be used on a Mac Plus with 20 megabytes of hard disk. The new Macs should be even more suitable to this top-end product. And top-end it is — even the price tag is on the upper end for Mac software.

Because desktop publishing does not begin and end with just the software and the Mac (although tens of thousands of users would disagree), Aldus has provided an interface to most applicable peripherals. Large screen monitors such as those available from Megavision and InfoMagic can be used to display two full A4-sized pages, side by side, at full resolution.

Most optical scanners can be used, providing that they output in the Macpaint format or TIFF (Tagged Image File Format). This is the sort of feature which gives desktop publishing a distinct advantage over conventional publishing methods where photographs and diagrams must be handled separately. The list of applicable graphics packages is large, to say the least.

For output, Aldus has chosen the Post-



Script standard, so any laser printer that supports that language should be suitable. However, they recommend the Apple LaserWriters and Dataproduct's 2665. The Apple Imagewriter dot matrix printers are also supported. Output may also be transferred to certain commercial phototypesetters.

Like anything that we judge for the Awards, user acceptance is very important. PageMaker has certainly scored very highly here. There are many commercial publications being produced every month in this country, thanks to this package. This is to say nothing of the hundreds of newsletters and club bulletins, price lists, menus, programmes and handbills which would otherwise lack a professional standard or would demand expensive third party typesetting and art services.

PageMaker allows almost endless

manipulation and composition of text and graphics, limited only by the imagination of the users and the physical constraints of the output device. (Be warned though — just as a word processor doesn't make a writer,

packages such as this do not make a graphic designer — there's still a place for talent.) Type sizes can be anywhere in the range from 4 to 127 points and line widths can be from 0.25 to 12 point. There are 10 patterns for shape fill as well as 10, 20, 30, 40, 60 and 80 per cent screens.

The Panel were impressed by PageMaker because it works so efficiently and has become the standard product of its type. It has set the pace for all future desktop publishing products. (We must point out that only the Macintosh product has been chosen here as the PC product was not available in 1986.) □

Product Details

Program:
Made By:
Review Copy from:

Aldus PageMaker
Aldus Corporation
InfoMagic
PO Box 131,
Eastwood 2122 NSW
(02) 858 4111
Desktop publishing
Macintosh 512 Kbyte or better
Standard manual
\$1095 taxed

Useful for:
Hardware Req'd:
Extras included:
Price:

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System Builder



SYSTEM BUILDER TOOLS MENU	
SELECT MENU OPTION _ _ _	
1:	FILE CREATE/RE-SIZE/DELETE
2:	FIELD DEFINITIONS
3:	SCREEN DEFINITIONS
4:	REPORT DEFINITIONS
5:	MENU DEFINITIONS
6:	AUTOMATIC PROCEDURES
7:	HELP/LETTER TEXT
8:	TEST/BASIC CODE DEFINITIONS
9:	PRINT FORM DEFINITIONS
10:	TRANSACTION DEFINITIONS
11:	PERIODIC FILE UPDATE DEFINITIONS
12:	COMMAND DEFINITIONS
13:	CROSS-REFERENCE FIELD INDEX
14:	PRINT DOCUMENTATION
15:	CONTROL FILE MAINTENANCE
16:	GENERATE SOURCE CODE

DESPITE THE POWER of database languages such as dBase, many people find that the learning curve prior to producing sophisticated applications, is just too shallow. While, there are application generators for dBase such as Genifer and the locally written CODA, another approach is to use a product which combines the database product with a sophisticated application generator.

This is just what System builder is — a sophisticated application generator. The product also differs from many PC packages in that it runs under a variety of operating systems which means portability between machines. On the PC family, System Builder runs under Revelation, a Pick-like system which operates under DOS. It will also run under PICK itself and UNIX.

Generating an application or 'system' is as simple as filling out forms on the PC screen. Tools are provided to create databases, screens, reports and menus and then define the transactions which link them all. As the system is built, so is the documentation. At completion, and from then, whenever changes are made, a complete set of manuals can be automatically produced. These use the help and tutorial

System Builder's Tools Menu — this is the start of a high quality, easily modifiable application.

screens which are written during the creation of the system, as well as the database structures, screens, reports and so on.

One of the major attractions of System Builder for PC users is the fact that terminals may be added to the PC running System Builder. Even without a network, this produces a multi-user system suitable for applications such as accounting, travel agency, or a booking system.

The problem with many powerful languages, is the trouble it takes to develop sophisticated applications with them. With System Builder, it's simply a matter of filling in a form on the screen.

Whenever desired, the application can be modified, with all relevant parts being updated. Password protection is provided at all stages. For those few tasks which System Builder cannot handle, there is provision to run these as external processes.

The Panel felt that System Builder showed a number of qualities which recommended it as a finalist. It produces high quality, easily modifiable applications; and it is very easy to master. Application generation audit trails and documentation are automatically produced, creating professional, maintainable systems every time. The ability to run inexpensive terminals without a network was also seen as a distinct plus. □

Product Details

Program:	System Builder
Made By:	Atech System Builder Ltd
Review Copy from:	SB Tech, 500 Oxford ST, Bondi Junction 2022 NSW (02) 387 4644
Useful for:	Generating applications
Hardware Req'd:	512 Kbyte RAM with a hard disk
Extras included:	Standard manual
Options:	Operates under Pick or Unix, or under DOS with Revelation
Price:	\$995 taxed (Revelation \$1495)

A \$5 million computer for just \$6995



DSE Multitech

Developing one of the world's most powerful computers costs millions of dollars. Multitech — one of the largest PC manufacturers outside the U.S. — spent \$5 million designing an advanced desk top PC that was not only powerful and fast but, more importantly, affordable too.

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calculated with 'What if...' variations almost immediately. And that power can be integrated into a cost-efficient networking system for every department of your business.

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grows with your business needs.

With power, speed and its very competitive price, the DSE Multitech PC-900 can do more for less. Compare the market... you'll be suitably impressed.

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Ask DSE to professionally install your new PC-900 — it's free!

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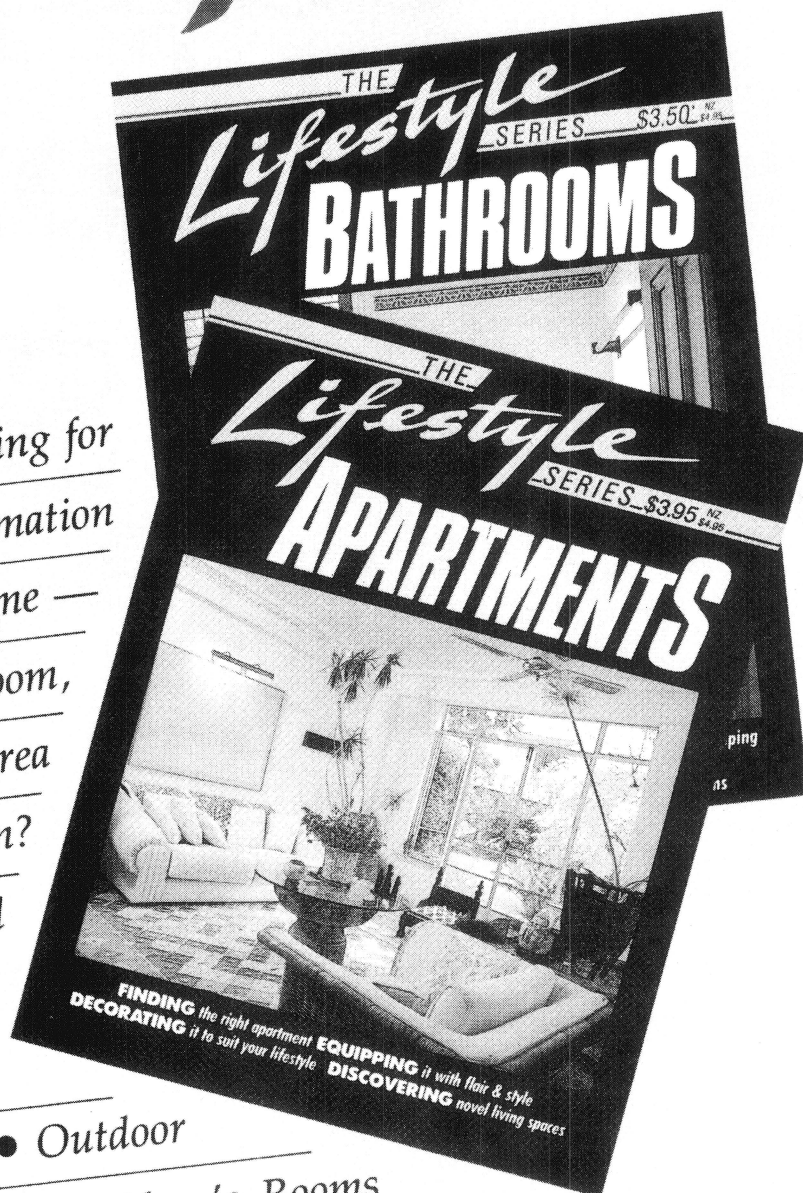
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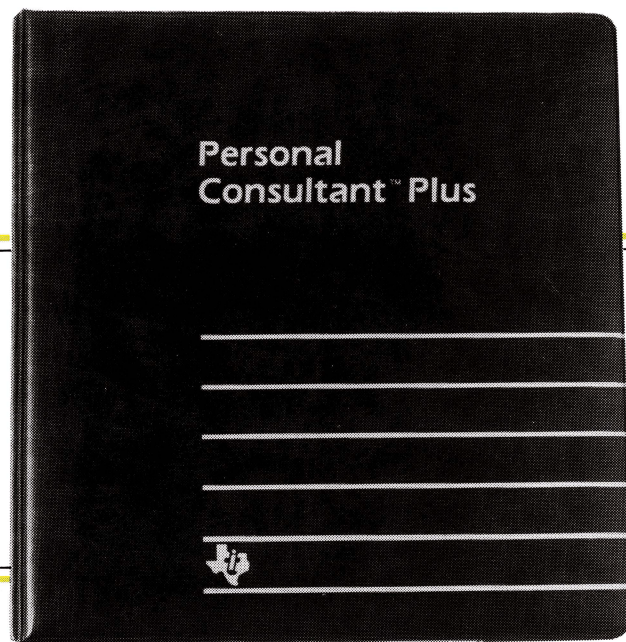
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MORE IDEAS, MORE INSPIRATION, MORE INFORMATION

Texas Personal Consultant



Texas Personal Consultant
*is an expert system
development tool that
expands the power and
sophistication of PC
applications.*

EPERT SYSTEM IS one of the latest 'buzz phrases' in computer jargon. Some cynics have said that they are just expensive toys without any real application on PCs. Texas Instruments disagree strongly with that line of thinking.

Expert systems learn rules and can apply them in a semi-automatic way to make decisions without the personal bias of humans. They can also be used in other situations such as teaching, system analy-

sis and problem solving. In many cases they are being used by relatively unskilled personnel, carried by the expertise of the skilled people who first set up the rules and imparted the wisdom to the database.

Whether this is a personal loan application system that's being used by a telephonist, or a pre-consultation interview system used by a medical practitioner, the aim is the same — making the knowledge of one or many people available at many places or many times. TI suggests that

these applications would be appropriate for Personal Consultant —

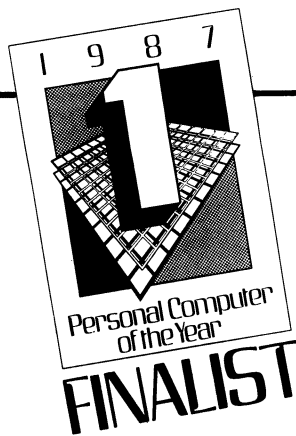
*Credit analysis and approval,
Equipment diagnosis,
Contract administration,
Insurance policy and rate selection,
Weather forecasting and crop estimation,
Circuit design and layout assistance,
Automobile and computer diagnosis.*

Personal assistant comes in two parts. There is an application generator for developing the system and a run-time system for end-user machines. The application generator consists of a rule entry language, a window-oriented editor and a debugging system. Input consists of precise rules or imprecise rules with uncertainty factors. There is also provision to capture graphics for use in applications such as training systems. Data can be accessed by external DOS packages such as dBase.

The PCOTY Panel chose Personal Consultant as a finalist because it is an excellent example of products which are expanding the power and sophistication of PC applications. Far from being an esoteric plaything, this is a practical system building tool. □

Product Details

Program:	Texas Personal Consultant
Made By:	Texas Instruments
Review Copy from:	Texas Instruments Australia 6/10 Talevera Road, North Ryde 2113 NSW (02) 887 1122
Useful for:	Development of expert systems or knowledge databases
System Req'd:	IBM PC/XT/AT or compatibles with 640 Kbyte RAM Runs on MS-DOS 2.1 or later
Extras included:	A run-time disk and system demonstration tutorial
Price:	\$1495 taxed



Turbo Prolog

PROLOG (short for programming in logic) was developed at the University of Marseilles by Alain Colmeraur. Unlike conventional languages, in which execution of statements follows a pre-determined order, a Prolog program really consists of a database of facts and rules which are used in an attempt to ensure the validity of a goal statement.

A Prolog program is therefore described as non-procedural, or declarative, which means that the program does not spell out a step-by-step procedure for solving a problem.

Variations on the original Prolog have been developed at several universities, with the most popular dialect being the one from Edinburgh University's Department of Machine Intelligence. Turbo Prolog is essentially an extension of this dialect, although it differs from most Prologs in being a compiler and not an interpreter. This has a number of consequences, and as a result Turbo Prolog programs look rather different from conventional Prolog programs.

In particular, Turbo Prolog is a strongly typed language, after Pascal, in which variables must be declared before use. A typical Turbo Prolog program will have at least three sections: domains, predicates and clauses.

The domains section corresponds roughly to the Pascal type section, while the predicates section effectively declares the functions which will be used later in the program. The clauses section is the meat of the program, and constitutes the 'executable code' of the program.

Let's look at an example. A few things to remember: in Prolog, words that begin with a capital letter are variables, while words with lower case initials are symbols (constants) or predicates. Predicates are statements, and are either facts or rules. This program contains both —

```
domains
    person, activity = symbol

predicates
    likes(person,activity)

clauses
    likes(ellen,tennis).
    likes(john,football).
    likes(tom,baseball).
    likes(eric,swimming).
    likes(mark,tennis).
    likes(bill,X) if likes(tom,X).
```

This program answers questions about people's favourite activities. The database contains one predicate, likes, and a clause such as —

```
likes(ellen,tennis).
```

should be read as 'ellen likes tennis'. The last clause is a rule:

```
bill likes something if tom likes it too
```

These statements constitute a simple Prolog program. To run it, and query Prolog's internal database, we simply ask it a question —

```
likes(bill,X)
```

In this statement, X is an uninstantiated variable, that is, a variable which does not currently have a value. In order to provide

Borland has done more to keep Pascal alive than any other company, and we can expect Turbo Prolog to do more to launch the widespread use to Prolog than any other product. So it is non-standard, so it has this awful typing; it will almost certainly become a new standard, and is certainly excellent value.

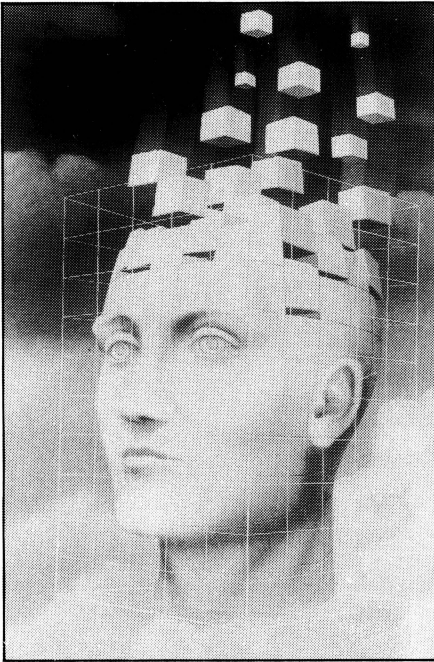
a value for X, the Prolog system searches through the available clauses for the predicate likes until it finds a clause in which bill is the first variable.

It now knows that bill likes something if tom likes it, so it institutes a second search through the database, this time looking for clauses about tom. If it finds one (and it does: likes(tom,baseball)) it takes the activity variable from that clause, plugs it into the clause about bill liking what tom likes and then plugs the result of that back into X.

Prolog will now print 'X = baseball', and then proceeds with its search through the database for other things which tom likes, because bill will like them too. It won't find any, but if it did, it would print them too. Having exhausted the clauses for tom, it returns to searching for clauses for bill, but again, it finds nothing else. It fi-

nally prints '1 Solution' and waits for another query.

That's it. Notice that Prolog will search repeatedly through its database of facts and rules to find the information it needs to satisfy a request. Contrast this with the conventional top-to-bottom flow of control in conventional programming languages and you'll begin to see why Prolog



is considered non-procedural.

Turbo Prolog is based on Edinburgh Prolog, but experienced users will find a number of inconsistencies: the use of = is slightly nonstandard; there is no = operator; the 'is' infix predicate is not supported, and no infix operators can be defined — one must always use functor notation.

On the other hand, Turbo Prolog contains a number of extensions which make life interesting: simple turtle-style graphics, sound, windowing, Pascal-like I/O statements, a built-in editor, access to I/O ports (useful for robotics applications), random access files, real arithmetic, trig functions and bitwise operators (again handy for robotics).

The documentation is reasonable, with separate tutorial and reference sections, but first-time users will need a copy of Clocksin and Mellish for background information.

Borland has done more to keep Pascal alive than any other company, and we can expect Turbo Prolog to do more to launch the widespread use to Prolog than any other product. So it is non-standard, so it has this awful typing; it will almost certainly become a new standard, and is certainly excellent value. ☐

The basic structure of a Turbo Prolog program —

```
domains
/*... domain statements    ... */

predicates
/*... predicate statements ... */

goal
/*... subgoal_1, subgoal_2, etc. */

clauses
/*... clauses (rules and facts) ... */
```

If you don't include a goal in the program, Turbo Prolog will ask for a goal when the program is executed.

Facts have the general form:

```
relation(object,object,...,object)
```

Rules have the general form

```
relation(object,object,...,object) if
relation(object,...,object) and
:
relation(object,...,object).
```

To be consistent with other versions of Prolog, if can be replaced by the symbol :- and a comma (,) can be used instead of and.

Thus

```
is_older(Person1,Person2) if
    age(Person1,Age1) and
    age(Person2,Age2) and
    Age1 > Age2.
```

and

```
is_older(Person1,Person2) :-
    age(Person1,Age1),
    age(Person2,Age2),
    Age1 > Age2.
```

are exactly equivalent.

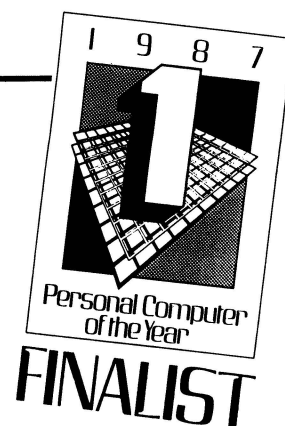
A predicate consists of one or more clauses. Clauses that belong to the same predicate must follow one another.

Software Report Card

Program:	Turbo Prolog
Made By:	Borland International
Review Copy from:	PC Extras, PO Box K9, Haymarket NSW 2000 (02) 319 2155
Useful for:	Expert Systems, AI programming
Hardware Required:	IBM PC or compatible
Extras included:	Natural language query interface example.
Price:	\$195.00

Austec's ACE Cobol

*ACE Cobol is an
extremely effective
programming and
operating tool for
commercial applications —
it's a powerful link
between the micro and
mainframe worlds.*



AUSTEC DESCRIBE their product as 'a 32-bit, multi-user high level Cobol compiler implementation written in C.' It will run on either 32- or 16-bit machines such as the IBM AT.

It supports both networking and native formats for compiled programs. The networking applications may be moved around between machines from micros to mainframes. It contains full debugging support, English language diagnostics and detailed source code listings. The compiler processor is the ANSI COBOL X3.23-1974 to FIPS high level with extensions for screen handling and concurrent file access.

The advantage to many users is the huge base of commercial applications already available under compatible versions of Cobol. Even non-compatible applications can normally be compiled with minimal source modifications.

Creation tools include extensive terminal handling facilities. Programmers may

construct a variety of displays, including menus and 'fill in the blanks' data entry. 'Picture' clauses are used to validate entries, putting up English error messages and highlighting the first illegal character.

Data fields may be accepted in replace mode (initially blank), edit mode (with pre-loaded contents) and secure mode

(where entry remains invisible). PC function keys may be programmed for use within applications.

ACE Cobol was chosen by the Panel because it represents a powerful link between the micro and mainframe worlds. It is an extremely powerful effective operating tool for commercial applications. □

Product Details

Program:
Made By:
Review Copy from:

Ace Cobol
Austec International
Austec Australia,
2nd floor, 344 St Kilda Road,
Melbourne 3004 Vic
(03) 699 4511

Useful for:
Hardware Req'd:
Extras included:
Options:
Price:

Compiling Cobol
IBM PC/XT/AT or compatible with 512 Kbyte
Manual only
Runs on MS-DOS, Xenix and Unix
Xenix \$3750, DOS \$2500, Unix \$5750
(tax not included)

Intelligent System Research's XL



Australia's greatest opportunities in the information age will come from home-grown software, say the industry pundits. ISR's XL, a 5th generation language, is one such product — and IBM agrees!

LOCAL COMPANY Intelligent Systems Research has developed and successfully marketed a product which they feel is the best of its kind in the world. In their own words 'XL is a technologically advanced, 5th generation language that uses artificial intelligence techniques for the purpose of building expert systems.'

XL is already being used at a number of educational and research centres around the world, as well as in many commercial applications, both in Australia and overseas. In fact, ISR place heavy emphasis on the point that the language was developed for commercial applications and is not meant to be just an academic exercise.

X-elerate, another ISR product, takes Unix code and produces C, which provides for portability, as opposed to say, LISP-based systems which are, for most intents and purposes, machine specific. This means that XL will run on just about any machine from an IBM PC upwards.

IBM themselves are impressed with XL — the two companies have entered into a cooperative agreement and IBM is promoting XL in conjunction with its powerful PC-RT RISC (Reduced Instruction Set Computer). Other computer companies are also marketing or co-developing applications written using XL.

At the first level, as rules are entered to produce a system, the rule base is handled using an interpreter. This allows fault finding and fine tuning. Once complete, the application can be compiled for greater speed and security. The rules, functions and facts all combine on disk as the 'knowledge base.' This is organised as a 'semantic inference net.' Once the system is built, it can test itself to find ambiguities and inconsistencies in the rules or functions, thus obviating conflicts or errors when live data is used. The programming itself is done using a system which ISR claims is simpler to learn and use than products similar products, such as Prolog. Programs can be both flow-directed and data-directed and each program can call the other. Already, a number of companies are producing third party, turnkey expert systems using XL.

The Panel were unanimous in that ISR's XL was a forthright example of an Australian company producing more than a saleable software product, it's a product that is at the top of its category, despite competition from US, European, Japanese and other Australian companies with much larger research budgets. For this reason, XL was chosen as a Finalist in the *Your Computer PC* of the year awards for 1987. □

Product Details

Program:	XL
Made By:	Intelligent Systems Research
Review Copy from:	Intelligent Systems Research, 2nd Flr, 969 Burke St, Camberwell 3124 Vic (03) 882 8287
Useful for:	Developing knowledge base systems
Hardware Req'd:	IBM PC/XT/AT or compatibles
Price:	Rental arrangement only

SUPERCOM

Supercom Executive



Complete Communications for the IBM PC



There's nothing new about a communications package that works well. What sets Supercom apart is the extra features — these could easily be sold as independent packages.

SUPERCOM IS A feature packed communicator with speeds from 75 up to an impressive 38,400 bits per second. It supports both XModem and YAM batch transfer protocols. And, sessions may be automated using a Script language. This makes Supercom ideal for unattended dial up and capture sessions, including Viatel. It handles all functions from dialing through password entry to logoff and store to disk.

Unlike many US-sourced comms packages, Supercom has full Viatel support (which is now considered essential for Australian use). To minimise connection time costs, the package allows automatic capture of all screens for later, offline playback.

Up to 99 numbers can be automatically polled when used with an Autodial modem. This is useful in chasing those elusive 'free' bulletin boards. Naturally, the package fully utilizes all Hayes compatible modems but will easily adapt to non-standard models (of which we see quite a few in Australia).

A welcome feature is the ability to run any DOS application from within Supercom, including script files. DOS paths are also supported. Most PC configurations will run Supercom, including EGA and

3 1/2 inch diskettes.

Perhaps one of the potentially most useful features is the 'Photostat' mode. This enables one machine to dial into and control another PC. Full echoing of the controlled PCs screen is provided, which is invaluable for remote diagnostics of applications such as spreadsheets. As the developers, OSR are fond of pointing out, this feature alone is available as a more expensive competitive product.

For those PC owners who sometimes need to use their machines as terminals to another system, Supercom provides emulation of more than 40 terminals. If even these are insufficient, the whole keyboard can be remapped and the emula-

tion editor used to create a work-alike for any terminal. In operation, Supercom may be menu driven by the tyro, or command line-driven for the impatient expert. Context sensitive help is available at all times. At all times the status line shows what is happening.

The Panel thought Supercom should be a finalist because of its technical excellence. The fact that it is fully Australian developed and manufactured is the icing on the cake. We were impressed by the thought which had gone into providing a multitude of features while not cluttering a defined application with unnecessary options or commands. We class this product with the best available PC software. □

Product Details

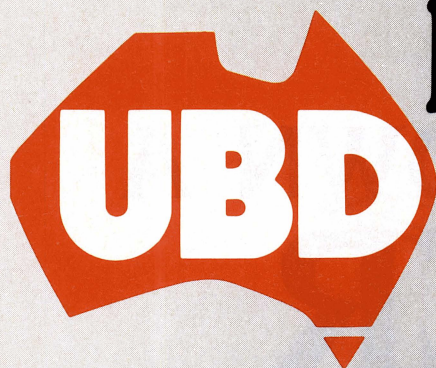
Program:
Made By:
Review Copy from:

SuperCom
Operating Systems Research
PC Extras
PO Box K9
Haymarket 2000 NSW
(02) 319 2155

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Hardware Req'd:
Extras included:
Price:

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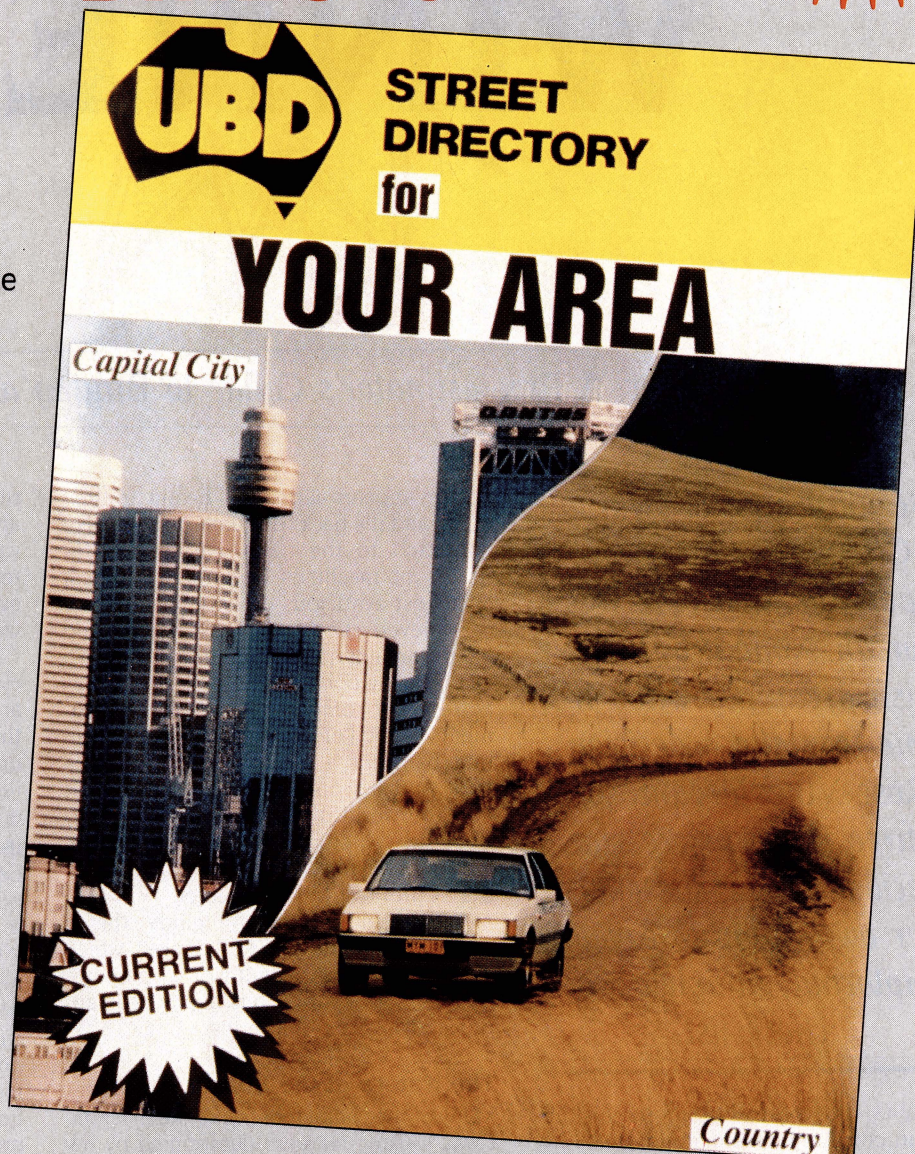
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WE CAN'T ALLOW A WINNER

— or, A Procrastinator's Guide to Buying a Computer

*We all dream of owning
Chendai or a Wang
Laptop, or an Apple IIGS
or an Amiga, but we
finish dreaming when it's
time to make a decision.
Rose Vines dreamt for
three years before she
decided - now she offers
her own guide to caveat
emptoring, complete with
check list.*

I WAS ORIGINALLY going to call this article 'A Procrastinator's Guide to Buying a Computer', because procrastinating is what it feels like I've been doing for the past three years — ever since I started working for *Your Computer*. You may think it's a life of excitement and satisfaction playing with all the latest hardware and software that appears on the market, but in many ways I find it incredibly frustrating: no sooner have I settled on my 'ideal' computer than some PR

person appears with a real beauty in their arms, and it's back to square one. I'm also subjected to the news, gossip and rumours of machines beyond my wildest and most avaricious dreams.

However, both 'procrastinator' and 'guide' are not quite appropriate. I have, in fact, already bought, sold and almost forgotten one computer — a Texas Instruments 99/4A. For a home computer, not all that bad, but a plaything rather than a tool. And it's only since I've moved out into the world of freelance writing, away from the well-stocked *Your Computer* office, that I've really had the *need* (as opposed to the desire) to own a computer.

And rather than being a 'guide', this is more a tale of my own experiences, which I hope will prove useful. Not a computer buyer's horror story, but a practical approach to caveat emptoring.

The Nature of the Beast

Many of the characteristics of the machine I was looking for were determined by my work — the rest by my bank balance. As I still review both hardware and software for *Your Computer* (and need to provide work on IBM PC compatible disks for other clients), an IBM compatible was the only choice. (No — I had no intention of paying extra money for the Real Thing).

If I'd had a couple of thousand more in my pocket, my choice would have been simple — the NEC APC IV. This is a beau-

tiful machine (see my review in the January 1987 issue of *Your Computer*), and good value for what you get, especially with the recent spate of discounting. However, even at a rock-bottom discount price, it was still beyond me.

So, it was into the dicey world of cheap clones. And dicey it is — these machines are cheap for a variety of reasons; some of them are good, and some rotten. My starting point was to make a list of my precise requirements, so I would enter the dealers' lairs mentally prepared —

IBM compatibility. It didn't really have to be 100 per cent (or as near as is legally possible), but I certainly wanted to be able to run programs like Sidekick, dBase III Plus and Turbo Lightning.

An AT compatible. This was the hardest decision to make, because an XT was capable of doing most of the work I required and I was worried I was merely falling for the lure of power. However, apart from the speed advantage of the 80286-processor-based ATs, they are rapidly becoming the 'business standard.' This means the efforts of hardware and software developers are being directed to producing new marvels for these machines; at the same time, they run all the software available on the basic PC. While I finally decided on the AT, I kept my mind open to the possibility of either saving money and getting an XT, or spending the same amount of money on an XT with a

What a delight to get a comprehensive price list; too often, a dealer will quote you a price based on some obscure configuration, and you'll have real trouble trying to keep track of the cost of the options you really want.

whizz-bang monitor and graphics card.

At least 640 Kbytes of RAM: (Random Access Memory — the internal memory used by the computer as fast, temporary storage, as opposed to disk memory, which provides permanent data storage). Some of the programs I use occupy around 400 Kbytes of RAM themselves, so the more on board the better. While the operating system only lets you use 640 Kbytes at one time, some software let's you get at any memory over that, or you can turn it into a RAM disk for fast access to your information.

A 20 Mbyte hard disk drive, one 1.2 Mbyte floppy disk drive and one 360 Kbyte floppy drive: It's not long ago I thought a 5 Mbyte drive was a lot of storage; these days 20 megs is the smallest drive you can buy, and it's horrifying how easy it is to fill that up. The 1.2 Mbyte floppy is standard fare on most ATs, and makes the job of backing up your hard disk almost bearable. These drives will read 360 Kbyte disks but are not reliable when writing to them, hence the need for a 360 Kbyte drive for exchanging info with my PC-bound colleagues.

A monochrome monitor with a Hercules-compatible monochrome graphics card: This was a compromise — I'd have liked a colour monitor but the EGA (Extended Graphics Adaptor) models are about \$1,000 out of my reach. And the CGA (Colour Graphics Adaptor) cards should never have been invented; they're an assault on the eyes. The mono monitor and card are fine for word processing — my main pastime — and run most other software I need.

A pretty basic, dot-matrix printer: All I was looking for in my printer was compatibility with the computer, adequate dot-matrix output, and a bearable speed and noise level.

DOS 3.2: Some machines still only offer DOS 2.11, which is getting somewhat ancient, and some machines can't run DOS 3.2 because of compatibility problems; I wanted to steer clear of them.

Doing the Rounds

I'd already seen a number of affordable AT clones at close quarters. Matt Whelan has been mass testing these boxes for what seems like years, and while most of the speed machines he's looked at have cost a packet, a couple — such as the Hypec and the Televideo — have been reasonably priced. However, some of the ads in various newspapers had caught my eye, and I wanted to see if any of the 'ultra-cheap' computers on offer were for me.

The Dick Smith Electronics offering, which, when I first looked at it, was one of the cheaper machines going, was very soon displaced at the bottom end of the spectrum by a number of machines. I checked out four of these machines: on the whole they seemed pretty similar — one clone looks a hell of a lot like any other. All of them were advertised along the lines of 'IBM AT Compatible for under \$1500.' This, of course, was for the system box alone, with a single floppy disk drive. 'Extras' included a monitor, graphics card, any memory over 256 Kbytes, an operating system, hard disk drive, and a disk controller card. With some of the machines, the keyboard was an extra, and you had to pay a couple of hundred more for a 'turbo' version (a computer which could be switched from the straight AT-compatible speed of 6 MHz to run at a higher speed, usually 8 MHz).

I wrote off a couple of these machines largely because of the approach of the salespeople. In one shop, the staff all had at least two phones in their hands, and spoke to customers in the shop in bursts of a few words, interrupted by a sentence or two to each of the callers on the phone and the yelling of orders to other salespeople. While this may indicate popularity and success, I had grave doubts about the attention and service I'd receive *after* buying one of their machines if they hardly had time for an explanatory word to me when I was still looking.

But, dear reader, I did finally manage to make a decision, and I'm now the proud

and only somewhat impoverished owner of an Ariel AT-compatible computer.

A Closer Look at Ariel

A *what?* Okay, it surprised me too. But I've been putting my Ariel through the wringer for the past few weeks, and I certainly haven't regretted my decision.

I discovered Computer Control, the distributor of the Ariel, through the pages of *The Australian's* Computer Section. When I visited its unpretentious offices, I was greeted by a salesperson (I later found out she was the manager) who was hard on knowledge and soft on selling. I checked over the basic machine, which looked

Shopping List for an IBM PC compatible

Software

(I've put this first, because that's when you should consider it).

□ MS-DOS (may be called PC-DOS) version 2.11 or higher — preferably version 3.1 or 3.2. This is the operating system for the computer, and it may or may not be included in the basic price of the computer. Make sure you know.

□ See any applications software you want to use — such as spreadsheets, word processors, graphics packages, and so on — running on your prospective computer, monitor and printer. Be especially careful if you're buying software that is copy protected — the software itself may be compatible with your system, but the copy-protection scheme may not. It's a good idea if you can buy both software and hardware from the same distributor; otherwise, try to test a copy of the software you want on the dealer's machine.

□ Software manuals. If you buy DOS or any other software, you should get a manual to accompany it. If you don't, the origins of your software may be suspect.

Hardware

□ Basic system unit with one 360 Kbyte disk drive, and minimum of 512 Kbytes of RAM.

□ Monochrome monitor. You'll also need a video adaptor card for connecting the monitor (although a few machines already have this built onto the main system board, with a port for connecting your monitor cable). Don't get a CGA (Colour Graphics Adaptor) monitor and card — the resolution is abysmal. Monochrome monitors give better resolution

solid and had plenty of room and power for expansion, and took a price list home (what a delight to get a comprehensive price list; too often, a dealer will quote you a price based on some obscure configuration, and you'll have real trouble trying to keep track of the cost of the options you really want).

The Ariel I finished up with had all of my requirements listed above: an 80286 processor (keyboard switchable from 6 MHz to 8 MHz), 1024 Kbytes of RAM (this amount was standard), a solid 200 watt power supply, eight expansion slots, an 'AT-style' keyboard, three drives, a 30.5 cm

Samsung TTL monochrome monitor and Hercules-compatible card, DOS 3.2, a 120 characters-per-second Star NX-10 dot-matrix printer, and 12 months warranty. All for under \$4,500. It's also designed by an Australian — admittedly an expatriate — and manufactured by his company, Digital Designs of Hong Kong.

In action, Ariel (I've quickly dropped the definite article) has done everything I've asked of her, although not without a few altercations early in our relationship. My chief complaint is the documentation (isn't it always?). It's not that it's bad — it's non-existent. I couldn't quite believe

there was no user's manual (you get a DOS manual if you buy DOS), but that is the case. It didn't matter too much to me, as I've had a lot of experience putting machines together (although it took me a while to find out how to switch the clock from 6 MHz to 8 MHz), but I pitied any computing newcomer trying to get this machine up and running.

I talked to the manager of Computer Control, Janice Courtney, and she said they're aware of the problem and in the process of writing a guide. As the manufacturer doesn't supply one, they have to write their own. In the meantime, they try

for a lower price. If you need colour, then pay the extra and get an EGA card and monitor. Your eyes will love you for it.

□ Keyboard — preferably 'AT style' with lights indicating when the CAPS LOCK and NUM LOCK keys are in action. If you are going to use a program such as Wordstar, which uses a lot of control key combinations, make sure the Ctrl key is on the same line as the ASDFGHJKL row of the keyboard. Otherwise, using commands such as :QS become a digital feat.

□ Serial and parallel ports (for connecting a printer, modem or other devices). You'll probably want one of each, and they'll either be built into the basic unit, or you may have to get a plug-in card which will provide them (a so-called I/O card).

□ A printer. Depending on your needs, you can get a slow daisy wheel which will produce typewriter-quality output, or a fast dot matrix, with lesser quality output. A dot matrix should print at 100 characters per second (cps) or faster, and will possibly have two speeds — a fast draft mode (perhaps about 180 cps), and a slower NLQ (near letter quality) mode. Get a sample of the output to take home.

□ Tractor feed mechanism for the printer, which lets you use continuous paper. Many dot-matrix printers already have a tractor feed built-in. If you need to produce many letters, envelopes, or other single-sheet documents, you may want to invest in a cut-sheet feeder. However, you can get high-quality tractor-feed paper with clean edges which makes a sheet-feeder unnecessary in most cases.

□ Cables. You need a printer cable to connect your printer to the computer. If you have a serial printer (attaches to the computer through the serial — or RS-232

— port you'll need a serial cable; if you have a parallel printer and port (may be called Centronics parallel) you'll need a parallel cable. You should also check you're getting the appropriate cables for your monitor and computer itself.

□ User guide and hardware manuals. You should get a guide to tell you how to get your computer up and running, and you should also get manuals for your printer, monitor, any add-on cards, and any other peripherals.

Extras and On-goings

□ Box of 10 double-sided, double-density 13 cm (5¼ inch) floppy disks. If your machine has a hard disk you'll probably find you need more. A 20 Mbyte hard disk full of programs and data requires almost 55 disks to backup! It may take a while to build up to this sort of volume, but believe me, you will. You may then find a floppy-disk box will save your sanity when trying to keep your floppies in order.

□ Box of continuous printer paper. You can get various qualities, from crummy stuff to good bond paper which has a clean edge when you strip off the tractor feed holes.

□ Printer ribbons. If you can, find out the printing life of your particular printer's ribbons, and the replacement costs. Some ribbons cost as much as \$70 to replace, while others sell for under \$10.

□ Warranty. You should be able to get a 12 months warranty on all your equipment — computer, monitor and printer. Check what it covers; whether you have to return the computer to them for service or whether an on-site service is included or available; and how long the average problem takes to fix (some companies take out the faulty board and

whack in a new one on the spot, so you can get back to computing without delay).

Optionals

□ If your data is vital to your business or you just can't bear the floppy backing up routine, it would be worth investigating a tape backup system — with one of these you can backup your whole hard disk to one tape. It makes life much simpler, and encourages regular backups.

□ EGA colour monitor and board. To add these to your system will cost no less than \$1,500. However, if you're heavily into graphics-oriented applications — including desktop publishing — you'll want to have one. I certainly do!

□ Voice-coil drive. If you're a speed freak, it won't matter how fast your processor is if your disk drive is slow. Many applications spend a lot more time conversing with your disk rather than the processor. A voice-coil drive will provide the speed to match your CPU.

□ Service contract. When your warranty expires, it may well be worth investing in a service contract. Check whether your computer dealer can offer you one, and check the various independent service companies to see if they'll provide a contract on your machine. Contract terms differ widely and so does the standard of service (and length of time it takes to fix your machine). Before signing, try to talk to someone who has already had experience with the service company. If the service contract price seems too steep, check the hourly rates charged by service companies and/or your supplier. A service contract is like any insurance cover — you may prefer the risk of not having a contract, but it is a risk. □

Buying a Computer

An uninitiated friend of mine looked at a high quality IBM XT clone and printer in a North Sydney shop and was told she could have it for the 'special' price of \$9,000, but only if she bought it within the next three days. Don't succumb to this sort of nonsense.

to sit down with each purchaser and run through the basic operation before they take their machine home.

I should admit, I didn't check whether a user's guide accompanied the machines before buying. Silly me, I *assumed* there'd be one. Lesson: don't take anything as given when buying a computer.

Physically, Ariel's no light weight. This is not necessarily a disadvantage — as a solid machine is preferable to some of the flimsy, plastic boxes that are produced — but it does make her somewhat immovable. Thank goodness, she operates fairly quietly. It's quite often hard to judge a computer's noise output in a bustling shop environment, even when you stick your ear against the case. But if you stick one of these machines in your home, it's amazing how loud they can be. Some also produce a very irritating high-frequency squeal. Not Ariel. She's also a very cool operator — even running for hours on hot days she remains far cooler than I.

The 20 Mbyte Seagate hard disk drive is slow. Computer Control offers the option of 30 and 40 Mbyte voice-coil drives, and if speed is paramount, get one of these. It'll cost you about \$800 more, but won't work against the speed of your processor. My expansion plans include such a drive as my first priority, followed by an EGA monitor.

The Samsung monitor was the cheaper of the two mono monitors on offer, but I actually preferred its resolution to the Thomson. Monitors are very personal things, so try reading a few screenfuls before you decide. While printer quality wasn't one of my priorities, I'm pleased with

the Star NX-10. However, it's worth checking the paper size a printer can handle (both in width and depth): the Star has two default paper lengths it can accommodate — 11 inches and 12 inches. This makes it difficult to use A4 paper which is about 11 $\frac{2}{3}$ inches long. The only way I've been able to do it is by writing a little Pascal program to change the page length through software. You may not want this sort of challenge, so beware.

Software-wise, everything I've tried running has worked, although I had a nasty fright with Turbo Lightning — a RAM-resident spelling checker and thesaurus. Each time I used it, Ariel locked up. However, when I finally found out how to run her at 8 MHz, Lightning worked perfectly. So too did dBase (in all its versions), Powerbase, Wordstar, Turbo Pascal, Sidekick, Revelation, System Builder and countless DOS utilities. Good enough for me.

Doing It Yourself

If you're planning on buying an IBM compatible, it's well worth looking at the cheapies on the market. While you may not settle on an Ariel, it's a good idea to go through the same steps I took —

- Make a list of all your requirements;
- Talk to other computer owners/users;
- Don't say 'Yes' to a machine on the spot. Go home and think about it. An uninitiated friend of mine looked at a high quality IBM XT clone and printer in a North Sydney shop and was told she could have it for the 'special' price of \$9,000, but only if she bought it within the next three days. Don't succumb to this sort of nonsense.
- Shop around. Even if the first machine you see looks ideal, it's worth checking around just to make sure you've made an excellent choice.

If you're worried about choosing a computer on your own, see if you can get a knowledgeable friend to accompany you. Otherwise, get an ignorant but cynical friend to go with you — they'll help you keep your perspective.

I've drawn up a sample 'shopping list' — it's given in the accompanying box; use this, or one adapted to your requirements, when you venture into the stores. Even when you know what you're looking for, it's remarkably easy to forget something like a printer cable when you're toting up the cost.

It's worth repeating the golden rule and adding a couple of others —

- Insist on seeing all the equipment you are going to buy in action *together*. This in-

cludes software and hardware, and especially applies to peripherals such as printers and modems. Knowing that they really *do* work together, can make troubleshooting when they *don't* want to work together in your home, a lot less painful.

- In most cases, you should choose your software first. This means deals which bundle a selection of software with a computer are only of value if you wanted that software in the first place.

- Make sure you specify *everything* you need when checking the price, and get a written, itemised list, including alternative configurations.

To my fellow procrastinators, a word of warning: it's very easy to wait around because you've heard that in three months' time 100 Mbyte hard disk drives will cost \$25.50 or IBM is just about to settle on a new display standard and EGA monitors will be old hat. While these rumours may be true, if you wait those three months, you'll just find another crop of equally enticing rumours doing the rounds. Get what you want *now*, and make sure your computer has room for expansion if you want to upgrade later.

As for me, I'm quite happy to recommend the Ariel to those who know where to plug the various cables. Computer Control also sells XTs and portables at outrageously attractive prices, and has just started selling the DSS Turbo, a cleverly engineered 10 MHz AT compatible which shows it's possible to combine ingenuity and value.

For those who haven't had much to do with computers, find out whether Computer Control has produced its user guide yet. Or, if you're game, get a savvy friend to hold your hand while you set up. The company gets your machine up and running for a number of hours before you pick it up, so you know it should work. They also format your hard disk and transfer your system files to it from floppy, so when you get it home, all you have to do is connect the leads and you're ready to go. That's some (but not sufficient) compensation for the lack of written instructions.

While there's a certain security in buying one the big-name IBM compatibles (or the IBM itself), I can't see it's worth paying double for similar goods. If you spend time deciding what you want and checking and testing the computers on offer, it's more than likely you'll find a cheap machine which provides an adequate combination of design, compatibility, reliability and service. □

MICROCOMPUTERS, MUSIC AND MIDI

Several years ago, certain major electronic music manufacturers around the world agreed upon a serial data-communications standard called MIDI (Musical Instrument Digital Interface). Since then, as Andrew Symaniz found, the mathematical science of computing, and the mystical art of music-making have been on collision course...

SCENE ONE: The science of computing has evolved considerably, since its early days of punch cards and teletype printers. Advances in microelectronic design and digital storage have spawned faster, more powerful microcomputers for the office, and home. In turn, these have become increasingly more affordable and easier to use and standard 'user-friendly' features on-board many recent breeds (windows, icons, mice and pull-down menus) are beginning to support more and more of the visual, tactile and audible elements of human communication...

Until recently, the focal point of most personal computer software has been on the visual aspect. But now, hardware designers, writers of software and users are beginning to appreciate a previously overlooked asset of computing — the ability to capture, process, store and reproduce sound *and* music via computer memory.

Scene Two

The proliferation of electronic music instruments, over the past decade or so, has recently blossomed into a veritable cornucopia of inexpensive, high-performance synthesisers.

In the mid sixties, before Wendy Carlos had introduced 'Switched-On Bach' to an unsuspecting popular music world, the electronic synthesiser was considered an unwieldy, laboratory-bound curiosity. And a very expensive one. Now, two decades later, and due largely to the new territories in music claimed by computer technology, the synthesiser invariably —

a) is programmable — each of its voice parameter controls can be instantly memorised and recalled with fine precision;

b) can be sequenced — either controlled internally, or via external devices which record, then replay musical notes, program changes, and the like; or

c) can even sample environmental sounds digitally for sound processing of playback.

Since MIDI's first official specification in 1983, virtually every music manufacturer

has incorporated some combination of this hardware and software protocol into most of their electronic products. This has enabled the musician to interconnect a wide variety of equipment from different manufacturers into small networks for composition or performance. And events generated on one instrument can be played on (or processed by) remote equipment — joined together with standard MIDI cables.

MIDI: Music Notation for Computer

Most MIDI synths have both a MIDI-in and a MIDI-out port, so they can serve either as a master that transmits performance data to other devices, or as a 'slave' that receives this information from external sources and responds accordingly. By inserting a computer into this arrangement, data from the master instrument can be collected, stored, analysed and then passed on to another MIDI device — or displayed for editing or printing in standard music notation.

In some synthesisers, analogue oscillators may be controlled digitally, whereas a different manufacturer might specialise in digital oscillators operated through analogue control. Fortunately, the primary

concern of MIDI is to allow for the unambiguous interchange of performance-data between various styles of synthesising equipment — whether they produce sound by additive or subtractive synthesis, FM (frequency modulation) or phase distortion techniques, digital sampling, waveshaping or wave-table lookup.

Like the RS-232 standard, which allows for the interconnection of printers and terminals from various manufacturers to various computers, MIDI helps keep the current generation of synthesisers compatible with each other *and* future products — rather than dooming several generations of synthesisers to eventual obsolescence when the next trend in sound generation comes along.

The Computer Interface

All computers require some sort of interface to translate computer data into serial MIDI data, and *vice versa*. MIDI interfaces for personal computers are seldom very complex or expensive to build, and usually contain an edge connector or socket that clips directly into the computer's expansion slots or user ports. Some PC's, like the Atari 520/1040ST and the Yamaha CX5M, have an on-board MIDI interface already built-in, so no further interface box is necessary. In addition to MIDI capability, the CX5M also contains an eight-channel FM sound generator on-board.

If you can tell which end is the hot-end of your soldering iron, you can build your own 'dumb' interface for the Mac and the Amiga for about thirty dollars. More expensive 'intelligent' interfaces (such as the Roland MPS-401 for the IBM PC, the Apple II and their various compatibles) perform some MIDI 'housekeeping' along with the standard MIDI functions.

Sequential make interfaces for the Commodore-64, as do Passport, who also provide for the Apple II family of computers. Passport are generally credited as having standardised the concept of a MIDI interface. There are also *de facto* standards for other popular computers such as the Macintosh. Often software is written with

several interface options in mind, which can be specified from the set-up menu.

Of course, these are all overseas products, but Ikon Distributors of Sydney are locally manufacturing interfaces for the Mac, Apple II and Commodore 64. They are happy to take orders to manufacture interfaces for almost any type of computer, but they need orders of 20 to 30 to keep the price down. (For more on Ikon, refer to the following story.)

Software and MIDI Communication

Since the introduction of MIDI, new software possibilities have been continually developed and refined. For example, the musician can now write in orchestral notation on the computer screen, then have this musical database drive an ensemble of synthesiser modules. Other utilities can also be activated that fine-tune voice parameter settings, organise sound-patches into libraries, sample sounds, analyse Fourier/waveforms, automate mixing or produce spectrograms — and the list goes on.

It is important to distinguish between MIDI performance data, and other sound related information such as parameter settings or sound sampling data, that can also be disseminated over the MIDI network.

The current focus of MIDI concerns itself almost exclusively with the physical elements of musical performance that change relatively slowly — typically in the

Some of the more powerful computers (like the Macintosh, and the Amiga, all based on the fast 68000 processor) can directly digitise sound from other sources, store it and play it back through specialised internal hardware.

order of milliseconds. In this situation, MIDI encodes player key-depressions, times of depression and other performance parameters that correspond with personal playing inflections. These include such things as velocity sensitivity (how hard the keys are struck), and movements of controller devices (pitch-bend or modulation wheels) that might be activated to impart vibrato, tremolo, sustain and other expressive effects.

Although the continuous controller devices can generate large quantities of inflection data (and require enormous amounts of memory when recording into the computer) not all these multiple dimensions may be implemented on every synthesiser. Nevertheless, the current

MIDI specification (1.0) is capable of 'broadcasting' an abundance of real-time performance information across 16 independent MIDI channels. Also, performance data encoded by a more powerful device can be rendered on less capable machines.

But since the current MIDI specification also allows for special 'system exclusive' modes (synthesiser specific), this feature can be utilised for on-screen editing of voice parameter settings for specific synthesisers connected to the computer.

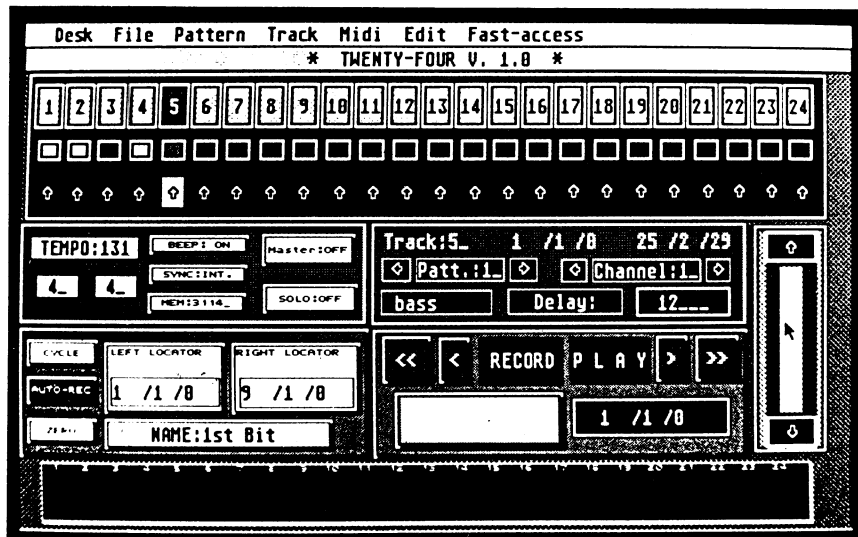
This edited patch information can then be stored on floppy disk. From there, groups of patches can be assembled from the master 'library', which can then be downloaded from the computer to the synthesiser. Disks generally provide greatly increased storage capacity for patch information, and at a fraction of the cost of the usual battery-backed RAM or EPROM synthesiser cartridges.

Other software that exploits the non real-time 'system exclusive' MIDI option are programs that allow passing digitally-sampled information between instrument and computer via MIDI, for waveform manipulation and analysis.

Sound-sampled data is represented in memory as a quantification of an analogue signal; and the data 'playback' rate, for any degree of fidelity, must approach the order of microseconds. MIDI operates serially at a rate of 31,250 bits per second. For purposes of comparison, a compact disk player can devour up to 1.5 megabits per second to faithfully transmit a stereo recording. Clearly the tremendous amount of data involved in manipulating complex, realistic digital sound in real-time with a computer can only be achieved using very large amounts of RAM — and dedicated hardware.

Some of the more powerful computers (like the Macintosh, and the Amiga, all based on the fast 68000 processor) can directly digitise sound from other sources, store it and play it back through specialised internal hardware. This technique relieves the microprocessor from much of the work typically associated with audio sampling.

Next month, we shall see that most popular computers can be persuaded to make some kind of sound, 'right out of the box.' Then we'll delve a little deeper into the subject, and investigate the range of the sound-producing capabilities of various computers. □

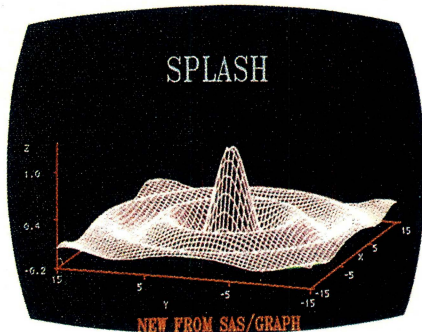


A tape recorder styled main screen display using a 24-track sequencer program from German company Steinberg Research and either an Atari 520 or 1040.

MULTISYNC HIGH RESOLUTION COLOUR MONITOR

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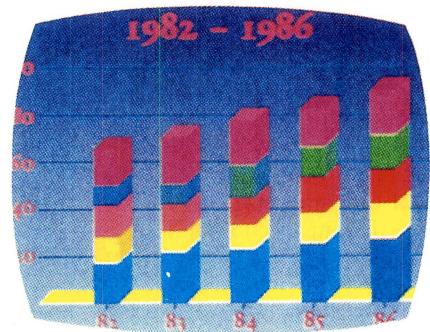
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Sync.	TTL positive/negative, separate or composite analog composite or Sync. on green
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Synchronisation:	
Horizontal	15.5 kHz - 35 kHz
Selection	Automatic
Vertical	50Hz - 60Hz
Resolution:	
Horizontal	800 dots (max.)
Vertical	560 lines (max.)
Bandwidth	30MHz (3dB)
Display Colours	8/16/64 in TTL mode Multicolour in analog mode
Active Display Area	250 x 180mm
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Play MIDI for Me . . .
The mathematical science of computing, and the mystical art of music may be on a collision course, but it's not yet easy to find where they've met.
Erstwhile photographer Barry Anderson went looking . . .

MY ORIGINAL INTENTION was to write an informative article about MIDI and its implications on the music industry. My musician friends had been babbling strange words like 'quantization', 'off-set', and SMPTE, that intrigued me. (SMPTE is actually an abbreviation of 'Society of Motion Picture and Television Engineers,' but the acronym also refers to the standard the Society has agreed on to 'interface' sound and pictures.) Questioning them on the meaning of all this esoterica, elicited answers that required further questions so . . .

I continued my research by looking for books about MIDI to help me write my article, but none of the staff in any of the book stores I visited had even heard of MIDI.

Undaunted, I thought the next most-likely place to find out about MIDI would be music stores. After visiting and phoning quite a few music outlets, I reached some very definite conclusions: *a)* the fundamental qualification for employment as a salesman for computer music or MIDI products is an intrinsic *misunderstanding* of what computers, MIDI, SMPTE and synthesisers are about; and *b)* the second qualification is the ability to colourfully criticize any product that the salesman doesn't know about or can't demonstrate.

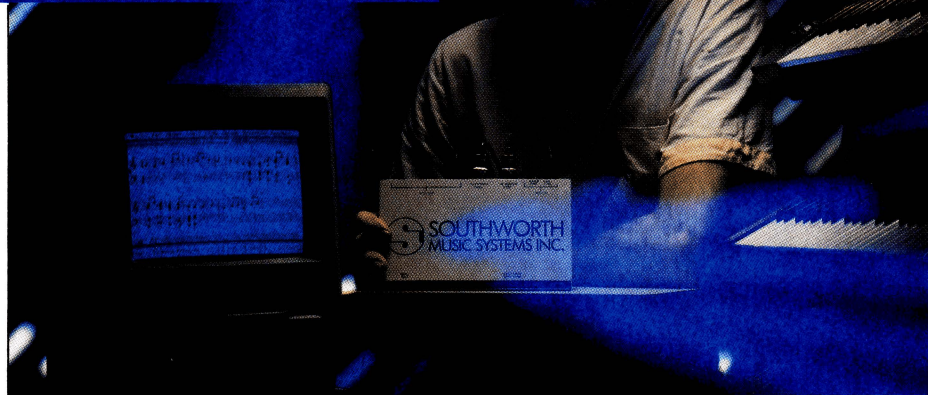
Why is this? It seems that given the current state of the art, MIDI and SMPTE implementation devices are 'support intensive' — this simply means that, at some stage, the user is going to have to ask someone with more experience for help. And that 'someone' doesn't appear to work on the floor in music shops.

After visiting what seemed to be hundreds of music outlets, I was beginning to despair of ever finding satisfactory answers to the questions that had been posed just by the *existence* of computer enhanced music, let alone writing my article. I decided to ring computer retail stores, manufacturers and distributors.

Almost every place I called where I found someone who knew what I was talking about, referred me to one place if I wanted to know more — Ikon Distribution in Sydney and speak to Ken Gunter.

Thus ended my researching research material.

As I soon discovered, music isn't the only business of Ikon — they import computer languages, barcode readers and barcode software, desktop publishing aids, various software programs and utilities for microcomputers and music synthesisers and, of course, MIDI and SMPTE software and hardware.



'Total Music is doing to music what computers did to word processors.' — Ken Gunter, Ikon Distribution. Photograph by J Barry Anderson.

The first question I put to Ken, one of Ikon's principals, was 'What is MIDI all about?'. The answer was simple: 'MIDI is just a way of allowing synthesisers to communicate with each other. Music devices equipped with MIDI are simply daisy-chained together; a computer is connected into the daisy chain and allows a musician or composer undreamt of power for composing, recording and performance.'

Ken demonstrated a MIDI software and hardware system called Total Music on the Apple Macintosh. It was astounding! Music from a keyboard, drum machine, whatever, can be played into the computer via a MIDI device and then be edited graphically. Notes can be deleted with a double click of the mouse, dynamics changed with a click — transposition, error correction (quantization), layering and more were demonstrated within 10 minutes of my first questions.

And that was only the beginning! The programmer of Total Music, Bill Southworth, has extensive programming knowledge and experience in communications. Consequently, he has been able to extend control of MIDI devices far beyond what MIDI was originally intended to do.

As I learned from Ken, 'one of the many problems facing a composer or musician is remapping the notes from one drum machine to another. He may write a drum part on his own drum machine only to find that the recording studio's better drum machine has different notes assigned to the sounds. Total Music's Global Interpolator option makes what was a tedious and time-consuming operation happen within minutes.'

'Because of its power and ease of use,

Total Music is now being used all over the world by major recording artists, producers, composers and musicians. It is also being used in conservatoriums to teach music composition. Total Music is doing to music what computers did to word processing.

The next program Bill Southworth is releasing is called MIDI Paint and has been written in assembler and C and it looks a bit like a spreadsheet. It has been designed to make manipulation of notes and musical phrases easier and would be ideal for producers, engineers and composers.'

Through Ken's involvement in the computer industry, he's noticed that 'computer programming and music go hand in hand; most of the programmers that have purchased a computer language from us are involved with music at some level of performance.'

'Programming, like writing music, is a creative activity that requires a great deal of time and energy to achieve the end result. Even the marketing of software is reminiscent of record companies with the way some software distributors have their Top 10 and talk of a product having a short, medium or long life — just like the pop music records.'

Ikon have now started developing their own software and hardware. Currently, they are readying for release a digital recording and sampling system for the radio broadcast industry that is aimed to replace the existing cumbersome and error prone system. Initially, this will run on an IBM AT and the first version should be available by the time you read this. They have also developed a terminal emulation program for the Macintosh that can be adapted for most mini and mainframe computers. □

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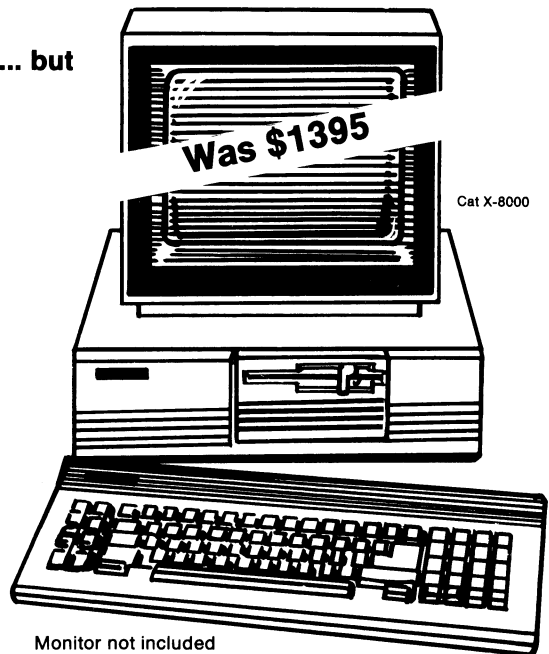
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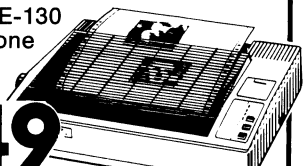
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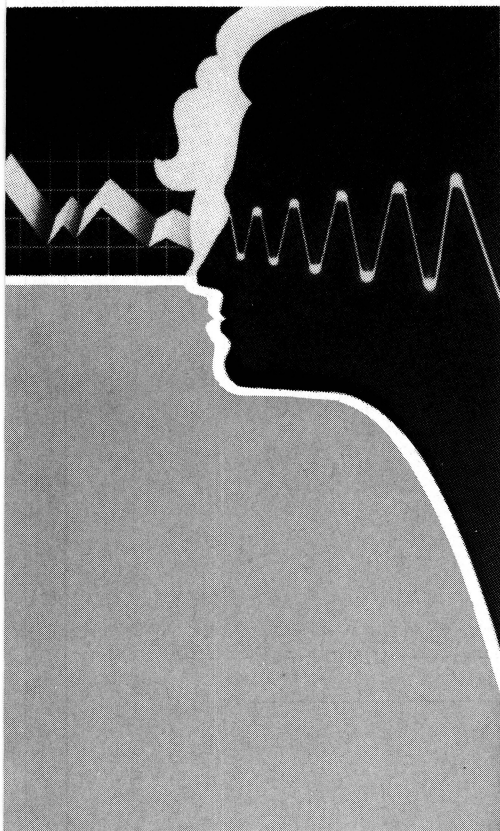
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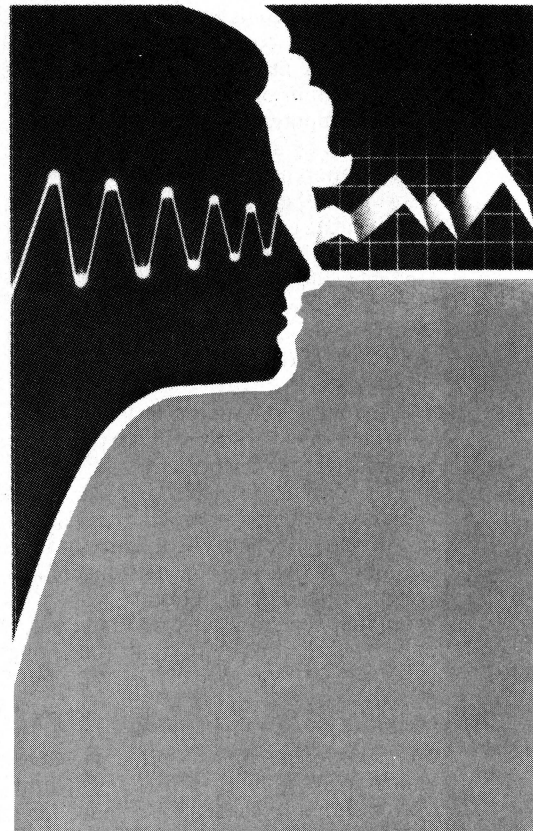
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HOW COMPUTERS THINK



Computers are just big, dumb brutes! That was what they said 30 years, when giant machines with names like ENIAC and UNIVAC were doing their thing. And are today's computers just dumb, tiny brutes? Or are they evolving towards something which could be called 'intelligence'? In the first article of his new series, Tim Hartnell, of no mean intelligence himself, examines the question of Artificial Intelligence . . .



MULTI-CENTURIES of person-effort over the past decade has been put into the task of creating that elusive 'artificial intelligence.' Are there any signs that the goal of producing AI is being attained?

Here, and in the future articles of this series, we'll be attempting to answer all those questions posed above, and to see if AI is anything more than another computer buzz-phrase, and if current AI research is likely to produce any significant advances in the near future.

'We may hope that machines will eventually compete with men in purely intellectual fields,' wrote Alan Turing, the tragic UK computing pioneer (he is believed to have killed himself by eating a poisoned apple, after being 'treated' by psychiatric drugs). 'But which are the best (intellectual fields) to start with?', he continued in his paper *Computing Machinery and Intelligence*. 'Many people think that a very abstract activity like the playing of chess, would be best. It can also be maintained that it is best to provide the machine with the best sense organs that

money can buy, and then teach it to understand and speak English. This process could follow the normal teaching of a child. Things would be pointed out and named, and so forth. Again, I do not know what the right answer is, but I think both approaches should be tried.'

Today, nearly 30 years after Turing wrote those words, we are still in the dark. We still don't know the best way to invest a machine with intelligence. Sure, our computers can 'compete with men in purely intellectual fields' in some ways. Any \$50.00 computer or \$5.00 calculator can do arithmetic better than I can, and computers can beat 95 per cent of the world at playing chess. But, although this would have been considered an extraordinary achievement just two decades ago, today it is hardly worth mentioning.

The boundary around AI is ever-receding. 'If you can teach a computer to do something really complex and abstract, like play chess, this will be a sure sign that intelligence has been produced.' That's what they said until a machine managed to play chess. 'But that's not intelligence,'

they said, and then posed another hurdle to be surmounted. But each time the new hurdle — whether medical diagnosis, locating mineral deposits, or going boldly to gain human expertise in a field where machines have never gone before — is surmounted, the old whinge 'But that ain't intelligence' crops up again.

So are we any closer to producing intelligence in computers than we were twenty years ago? And if not, does it matter? Does any one think it matters if the robot assembler on the Yakasushi production line is conscious of the craftsman-like skills he is exhibiting, or whether the robot takes pride in his workmanship?

It's up to you to make a judgement on our progress to date, the likelihood of future success, and the significance of such developments. These articles will give you a bit of a guided tour through the field, and then leave you to reach your own conclusions.

How Machines Think

Nearly all computers in use in the world today do things one at a time, proceeding

Artificial Intelligence

from step to step as they work out a problem, with each step determined (in part, at least) by the result of the previous step. Our brains, in contrast to this approach, use 'parallel processing,' in which more than one train of thought is underway at once. Computers can, to some extent, mimic this by switching rapidly from one task to another, giving a tiny bit of processing time to each process before going to the next, but this is not true parallel processing. Part of the work done by the Japanese 'fifth generation' project to produce true machine intelligence has concentrated on creating a computer which will *genuinely* do more than one thing at one.

If you want to build up little circuits of batteries, wires, switches and globes, you can easily emulate the process by which machines think. (In fact, to make things simpler, the computer program given with this article will allow you to carry out the experiments, without having to become a wizard with a soldering iron.)

Computer history tells us that George Stibitz, who worked for Bell Telephone Laboratories in America in the 1940s, built the very first electronic calculating device on his kitchen table one weekend. He wired batteries, bulbs and some telephone relay switches he'd flogged from work together to calculate in binary arithmetic. In due course, I'll introduce the program which will do the same thing, but we need a little bit more background first.

Stibitz knew, as I'm sure you do, that the binary arithmetic system uses only two digits, 0 and 1, and from them builds up any number it needs. A switch which is turned ON could be considered to be set equal to 1, while when OFF it can be said to be equal to 0. George realized that his crude, kitchen table, device (when sufficiently expanded) could work on any kind of mathematical problem. Apparently, he did not make the next crucial observation that his relays and bulbs could also be used to reach decisions. If he had, he would have produced one of the first 'thinking machines.'

A few years before, in 1937, another pioneer, Claude Shannon (who later also worked for Bell), had gained his master's degree at the Massachusetts Institute of Technology, with a thesis on the relationship between 'Boolean Algebra' (the very substance of electronic intelligence) and the flow of power through switched circuits.

We have to delve even further into the

```

10 REM LOGIC CIRCUITS
20 REM (c) Hartnell, 1987
30 REM Interface Publications
40 F$="OFF":N$="ON"
50 REM *****
60 REM OPENING MENU
70 CLS:PRINT:PRINT
80 PRINT "LOGIC CIRCUITS":PRINT
90 PRINT "PLEASE SELECT THE ONE YOU WANT:"
100 PRINT
110 PRINT TAB(10);"1 - ASSERTION":PRINT
120 PRINT TAB(10);"2 - NEGATION":PRINT
130 PRINT TAB(10);"3 - AND":PRINT
140 PRINT TAB(10);"4 - OR":PRINT
150 PRINT TAB(10);"5 - QUIT PROGRAM":PRINT
160 INPUT CHOICE
170 IF CHOICE<1 OR CHOICE>5 THEN 160
180 IF CHOICE=5 THEN END
190 IF CHOICE=1 THEN GOSUB 250
200 IF CHOICE=2 THEN GOSUB 480
210 IF CHOICE=3 THEN GOSUB 730
220 IF CHOICE=4 THEN GOSUB 1000
230 GOTO 70
240 REM *****
250 REM ASSERTION
260 A$=F$:B$=F$
270 CLS
280 PRINT "ASSERTION CIRCUIT":PRINT
290 PRINT "+-----SWITCH "A$;"-----LIGHT "B$;"-----+"
300 PRINT "|
310 PRINT "+-----BATTERY-----+"
320 PRINT
330 PRINT "TRUTH TABLE":PRINT
340 PRINT "SWITCH : LIGHT"
350 PRINT "+-----+"
360 IF A$=F$ THEN D$="0"
370 IF A$=N$ THEN D$="1"
380 PRINT "      "D$;"      "D$:PRINT
390 PRINT "PRESS THE RETURN KEY TO CHANGE THE SWITCH"
400 PRINT "OR PRESS ANY KEY, THEN RETURN, TO GO BACK TO MENU"
410 INPUT C$
420 IF C$<>" " THEN RETURN
430 IF A$=N$ THEN A$=F$:GOTO 450
440 A$=N$
450 B$=A$
460 GOTO 270
470 REM *****
480 REM NEGATION
490 A$=F$:B$=N$
500 CLS
510 PRINT "NEGATION CIRCUIT":PRINT
520 PRINT "+-----+-----LIGHT "B$;"-----+"
530 PRINT "      "D$;"      "D$:PRINT
540 PRINT "      SWITCH "A$;"      "D$:PRINT
550 PRINT "|
560 PRINT "+-----BATTERY-----+"
570 PRINT
580 PRINT "TRUTH TABLE":PRINT
590 PRINT "SWITCH : LIGHT"
600 PRINT "+-----+"
610 IF A$=F$ THEN D$="0":E$="1"
620 IF A$=N$ THEN D$="1":E$="0"
630 PRINT "      "D$;"      "E$:PRINT

```

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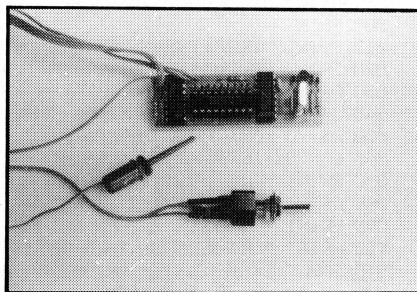
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For \$40 we also offer the V-20 IC, NEC's fast chip for 8088 machines, to boost the turbo speed of your PC by a further 5 to 20 per cent — fitting instructions included. The V-20 has another attraction: it allows your PC to run 8080-based CP/M-80 software and read and write CP/M files under PC-Eighty, the amazing new program from FBN, designers of SmartKey. Add \$140 to receive a copy of PC-Eighty.

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Programmers

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PL/PC is an advance programming language based on APL (A Programming Language) with Modula-2 control structures. It offers an integrated interactive programming environment for the rapid implementation of applications.

Structured programming is supported with Modula-2 control structures, block structured declaration of subroutines and automatic paragraphing of subroutines. Multi-dimensional arrays are easily manipulated with the large set of PL/PC array operators. Fundamental data types are extended to include complex numbers and strings.

A full-featured full screen text editor is included, the editor will automatically position the cursor at the point in the source code where the last compile-time or run-time error was detected. Data are edited with a spreadsheet like data editor.

English keywords are used instead of APL symbols, eliminating the requirements for special keyboard, character generator and printer.

An evaluation package is available for A\$25. The evaluation package comes with a reference manual and it has a limit of six global variables. The standard version is priced at A\$159 and the 8087 version at A\$299.

PL/PC requires an IBM PC or compatibles with at least 360K of memory and DOS 2.11 or higher.

See quick reference guide on page 12 of November, Your Computer

ED/PC

Fast full screen text editor for the IBM PC and compatibles. It can edit files up to 512K in size and 16,000 lines. Features include full cursor control, fast access to any part of file, regular expression for complex search and replacement, block move, copy, delete and write to file, case conversions, read external file, match brackets, variable regular tabs, horizontal scrolling, unlimited line length and auto-indent. \$79

All prices include sales tax, airmail postage and handling.



Creative Computer Software

117 York St., Sydney, NSW 2000.

Phone: (02) 261 1611 Fax: (02) 264 7161

Artificial Intelligence

```

640 PRINT "PRESS THE RETURN KEY TO CHANGE THE SWITCH"
650 PRINT "OR PRESS ANY KEY, THEN RETURN, TO GO BACK TO MENU"
660 INPUT C$
670 IF C$<>" " THEN RETURN
680 IF A$=N$ THEN A$=F$:GOTO 700
690 A$=N$:B$=F$:GOTO 710
700 B$=N$
710 GOTO 500
720 REM *****
730 REM AND
740 A$=F$:B$=F$:Z$=F$
750 CLS
760 PRINT "AND GATE CIRCUIT":PRINT
770 PRINT "+---SWITCH ONE ";A$;"---SWITCH TWO ";B$;"---LIGHT ";Z$;"---+"
780 PRINT " "
790 PRINT "+-----BATTERY-----+"
800 PRINT
810 PRINT "TRUTH TABLE":PRINT
820 PRINT "SWITCH ONE : SWITCH TWO : LIGHT"
830 PRINT "-----+-----+-----"
840 L$="1":IF A$=F$ OR B$=F$ THEN L$="0"
850 D$="0":IF A$=N$ THEN D$="1"
860 E$="0":IF B$=N$ THEN E$="1"
870 PRINT " ";D$;" ";E$;" ";L$;PRINT
880 PRINT " PRESS 1 THEN RETURN TO CHANGE SWITCH ONE"
890 PRINT " PRESS 2 THEN RETURN TO CHANGE SWITCH TWO"
900 PRINT "OR PRESS 3, THEN RETURN, TO GO BACK TO MENU"
910 INPUT C$:IF C$<"1" OR C$>"3" THEN 910
920 IF C$="3" THEN RETURN
930 IF C$="1" AND A$=N$ THEN A$=F$:GOTO 970
940 IF C$="1" AND A$=F$ THEN A$=N$:GOTO 970
950 IF C$="2" AND B$=N$ THEN B$=F$:GOTO 970
960 IF C$="2" AND B$=F$ THEN B$=N$
970 Z$=N$:IF A$=F$ OR B$=F$ THEN Z$=F$
980 GOTO 750
990 REM *****
1000 REM OR
1010 A$=F$:B$=F$:Z$=F$
1020 CLS
1030 PRINT "OR GATE CIRCUIT":PRINT
1040 PRINT "+---SWITCH ONE ";A$;"+"
1050 PRINT " "
1060 PRINT "+---SWITCH TWO ";B$;"+"
1070 PRINT " "
1080 PRINT "+-----BATTERY-----+"
1090 PRINT
1100 PRINT "TRUTH TABLE":PRINT
1110 PRINT "SWITCH ONE : SWITCH TWO : LIGHT"
1120 PRINT "-----+-----+-----"
1130 L$="0":IF A$=N$ OR B$=N$ THEN L$="1"
1140 D$="0":IF A$=N$ THEN D$="1"
1150 E$="0":IF B$=N$ THEN E$="1"
1160 PRINT " ";D$;" ";E$;" ";L$;PRINT
1170 PRINT " PRESS 1 THEN RETURN TO CHANGE SWITCH ONE"
1180 PRINT " PRESS 2 THEN RETURN TO CHANGE SWITCH TWO"
1190 PRINT "OR PRESS 3, THEN RETURN, TO GO BACK TO MENU"
1200 INPUT C$:IF C$<"1" OR C$>"3" THEN 1200
1210 IF C$="3" THEN RETURN
1220 IF C$="1" AND A$=N$ THEN A$=F$:GOTO 1260
1230 IF C$="1" AND A$=F$ THEN A$=N$:GOTO 1260
1240 IF C$="2" AND B$=N$ THEN B$=F$:GOTO 1260
1250 IF C$="2" AND B$=F$ THEN B$=N$
1260 Z$=F$:IF A$=N$ OR B$=N$ THEN Z$=N$
1270 GOTO 1020

```

Artificial Intelligence

past at this point. Boolean Algebra is based on the work of George Boole, a lecturer at Queens College, Cork, in Ireland,

switches and so on, we'll adopt the convention that when the bulb is lit, its state is called 1, and when it is off, the state is 0.

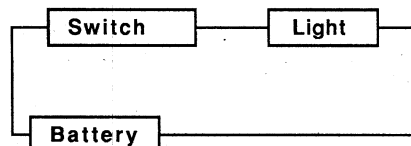


Figure 1a. An 'assertion circuit' — when the switch is on, the light is on.

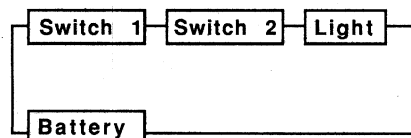


Figure 1c. An 'and gate circuit' — the light is on only when both switches are closed.

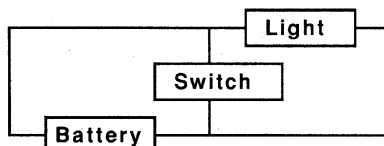


Figure 1b. A 'negation circuit' — when the switch is off, the light is on.

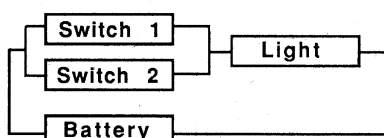


Figure 1d. The 'or gate circuit' — the light will be on if either switch is on.

in the middle of the last century. His book *An Investigation of the Laws of Thought on Which Are Founded the Mathematical Theories of Logic and Probabilities*, which was published in 1854, laid down the foundations of modern 'symbolic logic', which lies at the heart of your own computer's ability to make decisions.

'The laws we have to examine,' wrote Boole in the preface to his snappily-titled book, 'are the laws of one of the most important of our mental faculties. The mathematics we have to construct are the mathematics of the human intellect.' Until Boole's discovery, it had been assumed that logic was a branch of philosophy. Boole showed clearly that, instead, it belonged without doubt within the province of mathematics.

Switches and Decisions

We can investigate Boole's claims, and see how they relate to your computer, decision-making, and AI by using the program given with this article to reconstruct some of the devices Stibitz built on his kitchen table.

The first one is a very simple circuit, shown in Figure 1a, which contains a power supply, a single switch and a globe. You can see from the diagram that when the switch is closed, power will flow and the bulb will light up. We'll indicate that the switch has been turned on by saying that its state is '1'. When the switch is off, and the current does not flow, its state will be said to be '0'. That is, 1 equals on, and 0 equals off. In addition, in order to discuss the results of all these bits of wires and

The circuit shown in Figure 1a is said to be an *assertion circuit*. When the switch is on, the light is on. That is, switch state equals light state. (Wow!) If we draw up a little table to show the relationship between the states of the globe and the switch in an assertion circuit, we would get something like this —

SWITCH	LIGHT
0	0
1	1

A table like this is called, for reasons unknown to ordinary mortals, as a 'truth table'.

Now, in Figure 1b, we can see another simple circuit. If you look at this one, you'll see that the light is on (light state equals 1) when the switch is open (switch state is 0) and, once the switch has been closed (switch state set to 1), the current will flow through it, rather than through the light, so the light will go off (light state now equals 0).

This is a *negation circuit*, and the truth table for it looks like this —

SWITCH	LIGHT
0	1
1	0

Now we get to the more interesting bits, where circuits can *make decisions*. Imagine we have a circuit with two switches in it, as you can see in Figure 1c. With both switches closed (that is, turned on, with their states *both* equal to 1 [1 1]), the globe will light up. If *either* of the switches is off (one switch set to 1, and the other one to 0 [1 0] or [0 1]), or *both* of them are off (switch one set to 0 and switch 2 set to 0 [0 0]) the light will be off. This is called an *and gate circuit*.

The truth table looks like this —

SWITCH ONE	SWITCH TWO	LIGHT
0	0	0
1	0	0
0	1	1
1	1	1

Our final circuit is shown in Figure 1d, the *or gate circuit*. With this one, with the switches in parallel (they were in series in the 'and' circuit), the light will be on (state 1) if *either* switch one or switch two is on (either [0 1] or [1 0]), or both switches are on ([1 1]).

The 'or' truth table is as follows —

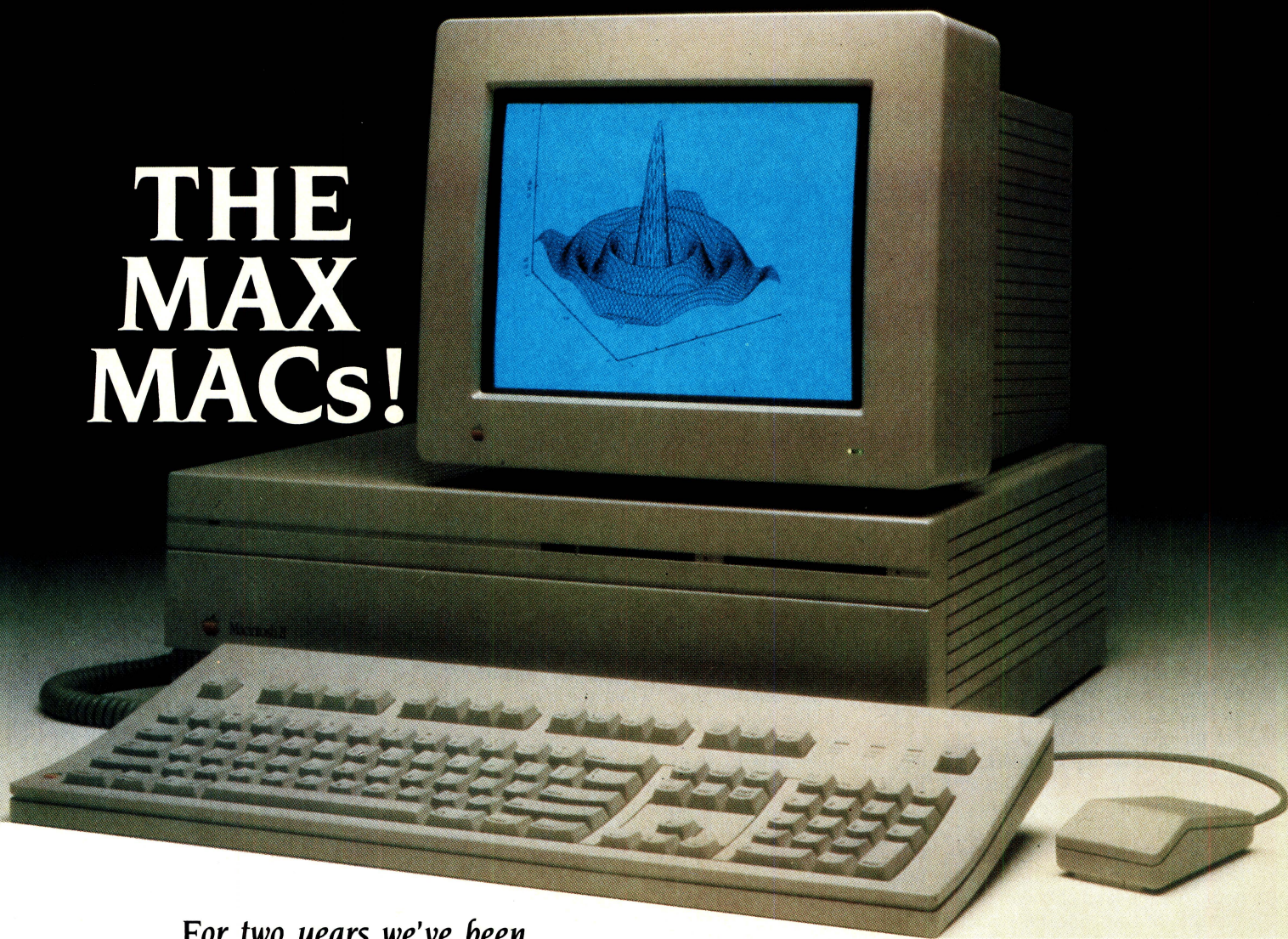
SWITCH ONE	SWITCH TWO	LIGHT
0	0	0
1	0	1
0	1	1
1	1	1

Now — your computer uses 'logic gates', just like these, except of course, they are not great big switches which needed to be turned off and on. Despite this, the elements of the chips in your computer act like thousands upon thousands of telephone relays.

You might like to try and construct (on paper), circuits which mimic more complex decision paths, such as IF EITHER A OR B IS TRUE, AND C IS TRUE, THEN DECISION IS YES.

In the next article in this series, we'll look further into the fascinating field of the development of machine thinking, and artificial intelligence. □

THE MAX MACs!



For two years we've been hearing what the new generation Mac would (or should) be like. On March 2 in Los Angeles, the rumour-mongering came to a halt as AppleChief John Scully unveiled not one, but two new platinum-coloured machines (even Steve Wozniak wore a suit!). Stewart Fist reports from AppleWorld ...

I GUESS THE impression that almost everyone seems to gain on first viewing the new Macintosh II is disappointment: the *cute-ness* of the Mac has gone and now we've got another big, ugly box, just like the IBM clones. But with the changes that Apple have made to the Macintosh, it was inevitable. They have to have somewhere to put all those new slots with an open architecture machine.

Many of the 'dramatic enhancements' (to quote Apple Australia's managing director David Strong) are aimed directly at 'serious' business, engineering and university users. In fact, many of the new fea-

tures were suggested by users in those professions during two year's field testing. Apple's marketing strategy for the next several years is aimed directly at 'key' corporate users and the government and education markets. The company has gone all out to ensure that almost every practicable feature has been included.

Macintosh II

When you open the box of the Mac II, you come across the hard disk unit and an 800 Kbyte floppy disk drive (a second floppy drive is optional). Take these out, and you are back to an empty box with a large

green motherboard, reminiscent of the early Apple IIs, only larger.

The difference now is that where the Apple II had a rather conventional CPU and memory chips, the Mac II has state-of-the-art VLSI (Very Large-Scale Integrated) chips — each of which on its own is more complex than the whole, original Apple II architecture. Once you open the box, this move to VLSI and surface-mounted memory chips is obvious.

The CPU is the new 'M68020 Macintosh' running at 15.7 MHz with a 68881 floating point co-processor — it calculates 300 times faster than the Mac Plus, we're told.

The Mac II comes with 1 Mbyte of RAM, surface-mounted on four small memory cards. You have space to add another four, giving you 2 Mbytes, and you can go to 4 (and later 8) Mbytes on the main board by replacing the cards with those carrying the new high density chips (SIMMS, or Single, In-line Memory Modules, in Apple parlance). From here, up to the maximum of 1.4 Gigabytes, you need to add memory via plug-in cards.

In Australia, the computer will be available in two different versions, varying only in internal configuration. Both models have 1 Mbyte of RAM and a single floppy drive as standard; for the base model, dealers can offer either a second floppy drive or an internal SCSI hard disk (available in 20, 40, or 80 Mbytes) as options. The second version has an internal 40 Mbyte hard disk as standard.

NuBus Connectors

The NuBus connectors on the motherboard are the real difference, of course. There are six of these to handle the expansions slots and they have been designed to support multiple processors. The quoted data transfer rate is an impressive 10 Mbytes per second.

NuBus was originally developed by U. Massachusetts Institute of Technology, and later by Western Digital, before being standardised under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). 'Standardised' is the very reason Apple choose to use this particular connector, of course — already third party developers are showing all sorts of plug-ins that will take the Mac into new areas of business, industry and higher education.

The bus, described as 'true 32-bit,' allows signals to travel synchronously at up to 10 MHz and it supports 8, 16, or 32-bit data paths. It's independent of the processor and allows the machine to transfer data between the logic-board and the add-in cards in large quantities, *fast*.

NuBus uses an arbitration and geographical addressing system, so the add-in cards can 'identify' themselves, and provide the system with information about their configuration. Gone is the need for setting dip-switches, which is definitely worth a round of loud applause on its own.

I was most impressed with the way in which the NuBus design allows Mac software to be windowed on to separate screens. Plus, you can plug-in up to six monitors — each with their own videocard

— and send each screen a separate window. This is all builtin to the hardware, so any standard Mac software (or 90 per cent of it, anyway) will have this ability.

I can see many power users running two screens on their Mac II as a matter of course.

NuBus uses an arbitration and geographical addressing system, so the add-in cards can 'identify' themselves, and provide the system with information about their configuration. Gone is the need for setting dip-switches, which is worth a round of loud applause on its own.

Keyboards

There are two keyboards available for the Mac II. The standard unit is a typewriter style, 81-key board with numeric keys and a cursor pad. The optional extended board adds 24 keys, including a T-cursor pad and function keys that will be needed for running MS-DOS ('an alternative operating system,' as Apple describes it) and for terminal emulation.

Monitor

The Mac II comes with a video interface card that fits into one of the slots and lets you use high-resolution monitors. Apple themselves have provided two: the 12-inch Apple Analog Monochrome Monitor (640 x 480 pixels, 76 dots per inch and a scan rate of 66.7 MHz), and the 13-inch Apple Analog RGB Colour Monitor (640 x 480 pixels, 69 dpi and the same scan rate). But, third-party developers are *already* providing their own monitors — there was one on show at the AppleWorld Expo running the developer's own software and the results are stunning.

Two options are available with the video card — you can have either 1 to 4 bits per pixels to display 16 colours or shades of grey; or 8 bits per pixel to dis-

play shades of grey or 256 of the 16 million colours available on the palette.

All of the new power features and the new mass storage capabilities should help Apple hold its share of the desktop publishing market — a share that has certainly been threatened recently with the launch of the IBM publishing packages. Of course, the new Mac is going to be an important small CAD machine, and an engineering workstation. There were a lot of CAD and drafting applications on show, and they look very impressive on the wide screen.

Ready-Set-Go Version 3, for instance, can be seen in full A4 page size on the left-hand side of the screen, while on the right you have space for holding 'clip-board' graphics and additional text. You can see the lot on the one screen without moving about. It makes the Mac feel like a different machine.

Lotus were showing Galaxy at AppleWorld. This is an expanded version of Lotus 1-2-3 — while still spreadsheet-based, it provides graphics, word-process-▶

The Event

I'VE BEEN TO Tupperware conventions and watched in amazement as a thousand Tupperware dealers sing the Tupperware song, and applaud every jargon-laden marketing phrase preached by company executives.

The opening session of AppleWorld 1987 in Los Angeles' Universal City Amphitheatre was much like that — but with less fanaticism and much more reason. This was a big event in Apple's corporate life.

The Amphitheatre held the 3,000 delegates from around the world with space to spare, and Apple's president, John Scully announced the arrival of the two new Macintosh lines with only a modicum of theatrics. The days of coloured smoke, search lights and go-go dancers are over for Apple. Now they are demonstrating their pin-stripe credentials for the business world.

Mind you, they did finish the affair with a fireworks display — but this lapse into excess was offset by having Steve Wozniak on stage in a suit. And we all thought he had been grafted into his jeans and denim jacket!

None of this dampened the enthusiasm shown by the audience of dealers and product developers (plus an international press brigade). Everyone loved the new machines and showed their enthusiasm with all the style of a Tupperware crowd. □

ing, a database, communications and forms. On the 19-inch screen they were using, spreadsheets which really look like spreadsheets. You've got about 20 columns, and up to 50 rows on a workable level. Galaxy also has an extensive command language and you can build very impressive macros.

And, there's a custom chip for sound. It incorporates a four-voice design that's compatible with existing Macintosh sound and music software.

At press time, Apple were expecting to have Mac IIs ready for delivery in Australia in May or June.

What About the Mac Plus?

The Macintosh Plus now becomes the base model in the platinum-coloured range. Apple are claiming that 'over 90 per cent' of existing Macintosh software will run right across the new range of Macs, so there's still plenty of life left in the new girl.

The Macintosh SE

On first appearances, the Mac SE looks like a re-vamped version of the standard Mac Plus (the SE is designed to slot into the range between the Plus and the Mac

A lot of computer commentators have suggested that the success of the Mac depends on it integrating with the MS-DOS world, and Apple have now done this with a vengeance.

II). But they've completely redesigned the circuitry to boost performance (and probably cut production costs) by using VLSI. Apple claim a 15 to 20 percent speed boost for the processor (still the 68000) for the SE, and a dramatic improvement in the transfer rate through the SCSI port. A SCSI hard-disk on the SE is said to transfer data at twice the rate of one on the Mac Plus.

The redesign has also made more room inside the box for disk drives. You can buy the SE with two built-in 800 Kbyte standard disk drives, or with one 800 Kbyte

drive and a 20 Mbyte SCSI internal hard disk. All this has been achieved without altering the small size footprint of the old machine.

The SE only has one expansion slot, and this is not the NuBus standard of the Macintosh II; it is called an SE-Bus. Superficially, the cards look much the same and have a very similar connector. You'll be able to get communications cards, MS-DOS compatibility cards, video cards or performance acceleration cards from third-party developers.

With the SE-Bus, a card developer can access all signals on the Mac logic board through a 96-pin Euro-DIN standard expansion port, which will provide tremendous flexibility in product design. (There were a couple of accelerator cards using the 68020 processor on display for the SE, but I didn't see any operating).

I understand that many of the new SE-Bus plug-in cards also provide a slot for further expandability, so — to a degree — you can eat your limited one-slot cake and still have it too.

There are the same two keyboard choices with the SE as with the Plus (*thank God!* for the cursor keys). With the extended keyboard you've got all the complexity of an IBM PC-type machine, plus the mouse.

A couple of third-party developers also had key-boards on display, so there should be a wide range to select from when the SE goes on sale. Apple say they are shipping this machine immediately, since they can build it on their present Mac production line.

In Australia, the Macintosh SE will also be offered in two different versions, both of which should be on sale in Australia by the time you read this. There will be a base configuration with 1 Mbyte of RAM and two internal 3½ inch floppy drives. The enhanced version will have a 20 Mbyte internal hard disk and a single floppy drive.

MS-DOS

A lot of computer commentators have suggested that the success of the Mac depends on it integrating with the MS-DOS world, and Apple have now done this with a vengeance.

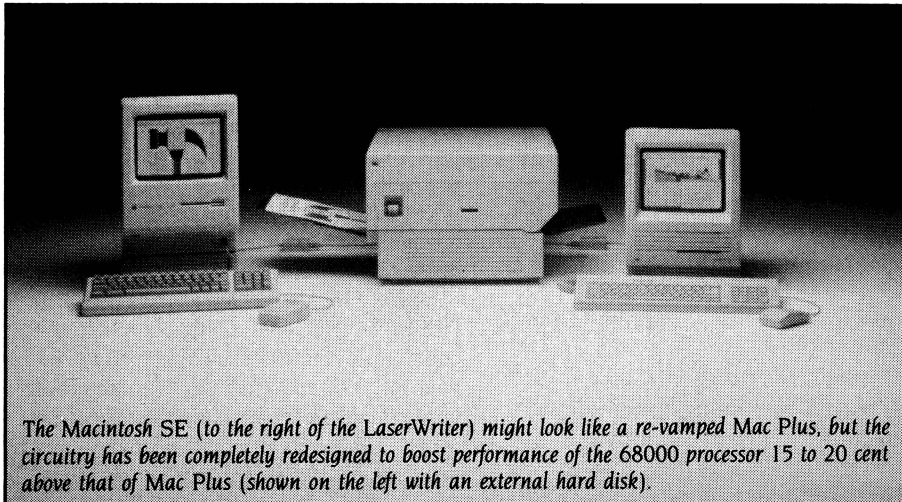
Apple provide MS-DOS data file compatibility through InterFile, a file transfer program, and by making available a 5¼ inch MS-DOS floppy disk drive and drive controller card.

Third-party developers are already

Product Details

Product:	Macintosh II
Made By:	Apple Computers Cupertino, California
Review Machine:	<i>as soon as we can get our hands on one</i>
Processor:	M68020 with 68881 floating point co-processor
Clock Speed:	15.7 MHz
RAM:	1 Mbyte standard — see text for details
ROM:	256 Kbytes
I/O:	Six builtin ports (two serial, one stereo sound), one Apple desktop bus, SCSI drive
Keyboard:	81-key board standard 105-key board optional
Monitor:	640 x 480 pixel 12 inch monochrome, 640 x 480 pixel 13 inch RGB colour optional
Peripherals:	1 Mbyte and 2 Mbyte memory expansion kits, Ethernet interface card, video expansion card, Apple monitor stand, Apple PC drive card Macintosh 68851 PMMU upgrade Apple PC 5¼ inch floppy disk drive
Expansion:	See text
Price:	with single floppy drive \$7693; with 40 Mbyte hard disk \$10,980; monochrome monitor \$772, colour monitor \$1911 plus control card \$972, 40 Mbyte tape backup \$3010, (pre-release prices, tax included)

The Max Macs!



The Macintosh SE (to the right of the LaserWriter) might look like a re-vamped Mac Plus, but the circuitry has been completely redesigned to boost performance of the 68000 processor 15 to 20 percent above that of Mac Plus (shown on the left with an external hard disk).

showing MS-DOS co-processor cards for both the Mac II and the SE. So if you just want to read Lotus 1-2-3 data files and integrate it into your Mac spreadsheet, you can with InterFile — but if you want to go the whole hog and actually run Lotus 1-2-3 or dBase III on the Mac, you can use a plug-in board.

AST's plug-in board for the SE also provides you with another slot, so you can add further plug-in features even when the slot is occupied.

Unix

Apple will be offering a version of Unix for the new Mac II. The basic machine, when it becomes available in May or June, will

have a spare connector for a VLSI memory management chip which allows multitasking, and gives access to Unix.

UniSoft Systems have developed Apple's Unix software (called A/UX) under contract. It is a full implementation of the AT&T Unix, System V, Release 2, Version 2 operating system and includes features from Berkley's 4.2 BSD version.

In the past most business users have avoided Unix because it is too difficult to use, but with A/UX Apple have managed to incorporate the Macintosh Tool Kit, so the use of Unix software should now become as simple as using any Mac application — so they say. Unix wasn't on show.

Product Details

Product:	Macintosh SE
Made By:	Apple Computers Cupertino, California
Review Machine:	coming soon
Processor:	M68000
Clock Speed:	7.8 MHz
RAM:	1 Mbyte standard — see text for details
ROM:	256 Kbytes
I/O:	see text
Keyboard:	81-key board standard 105-key board optional
Monitor:	integral
Peripherals:	Apple PC drive card, Apple PC 5¼ inch floppy disk drive,
Expansion:	One slot — see text
Price:	with floppy drive \$5320; with 20 Mbyte hard disk \$6905; with 40 Mbyte \$4013; 80 Mbyte \$6522; 40 Mbyte tape backup \$3010 (pre-release prices, tax included)

\$\$\$?

Macintosh II: In the basic configuration the Mac II will cost US\$3,898 in the States, so from past experience you should at least double this for Australia. At this level you only get one 800 Kbyte disk drive, the standard Apple keyboard, and 1 Mbyte of RAM. (Apple had not yet released the on-sale prices at press time, but we believe this configuration will retail for A\$7,693 — ed).

With the addition of a 40 Mbyte internal hard disk unit, the cost jumps to US\$5,498 — so for a good workable unit in Australia you should expect to pay about A\$10-13,000. (\$10,980, our sources say. For other pre-release prices, refer to the Product Details table).

Macintosh SE: The bottom level of the SE range comes in at US\$2,898, with 1 Mbyte of memory, two 800 Kbyte drives and the standard keyboard. With a 20 Mbyte SCSI hard disk instead of one of the 800 Kbyte drives, the price jumps to US\$3,698. (Pre-release prices: A\$5,320 and \$6,905, respectively — see the Product Details table for other options). □

More from Apple..

SEVERAL WEEKS BEFORE the release of the new Macs, Apple announced three new products that make the new Mac range all that much more interesting —

The **AppleShare** file server supports file and application sharing on any AppleTalk network and can be extended to other networks with data bridges. It will work with a network of up to 25 Macs and peripheral devices.

There are security features that let users selectively share information within the network. All users receive updated information at their workstations whenever a document is created, deleted or moved between folders. The file server, priced at \$1395 including tax, is configured with a Mac Plus and hard disk.

The **LaserShare** print spooler allows documents to be spooled to a dedicated Macintosh print server where they are queued for printing. Spooling frees the originating machine for other work while the documents are printed in a first-in, first-out order, or priority printing of a particular document can be nominated. The spooler is priced at \$595.

The **AppleTalk PC Card** integrates computers running MS-DOS into an AppleTalk network. This half-size card (\$745 including tax) plugs into a PC and then joins the network via a DB9 AppleTalk connector; PC use of the LaserWriter is supported. □

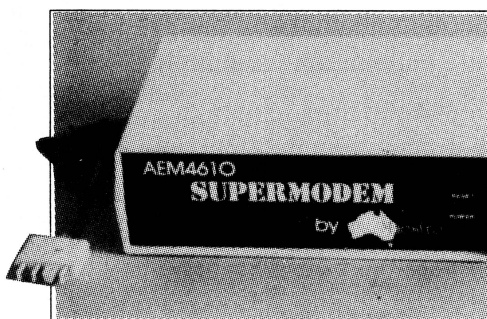
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GPA SUPERMODEM: \$395

A revolutionary, new, Australian-made modem for IBM, Apple IIc, etc.

"1200/75, 300 Baud full duplex, Hayes-compatible, auto-answer, auto-dial, auto-disconnect, auto-Baud rate select, auto-line turnaround, fully software controlled, VIATEL, RS232 connection, optional V.22 1200 Baud full duplex, mains powered, microprocessor controlled, intelligent standalone modem for IBM, Apple IIc, Macintosh, MicroBee and any computer with a serial port for under \$400....."

GPA SuperModem is at least 25% cheaper than any comparable modem!



GPA Supermodem connects to phone and serial port

And, of course, by now you'll know that we built thousands and they have taken Australia by storm. Telecom, Westpac, CSIRO, UNSW are some of our larger customers. Their responses have been universally enthusiastic: "Fantastic! How did you do it for the price?" or "We want more of them. When will you have more stocks?" Some of our customers have bought up to 10 modems at a time!

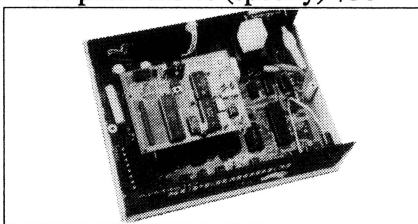
For the first 3 months of production demand exceeded supply, but we have caught up now and SuperModems and V22 boards are now in stock. We have cables to suit most micros and can advise on the most suitable software for your computer. Viatel software is now available for the IBM and Apple II+, IIe, IIc. Terminapple comms software to suit also available.

Telecom Approved

Approval # C87/37/1578

TECHNICAL FEATURES

- * Standalone, direct-connect serial modem
- * 6809 microprocessor controlled
- * Auto-answer, auto-dial, auto-disconnect, auto-line-turnaround
- * CCITT V21 and V23
- * V22 option, 1200 baud full dup available now for \$190.
- * VIATEL software available \$35 (Apple/IBM)
- * Plugs into any serial port
- * Automatic Baud rate selection
- * Mains powered & onboard speaker
- * Telecom approved C87/37/1578
- * Fully software controllable
- * Internal expansion slot
- * Computer cables (specify) \$30



GPA Supermodem: Note V22 board installed

"That's all very well, but what do I DO with a modem?"

* **WORK FROM HOME:-** Interrogate your office computer. Send and receive messages, text for typesetting, price list updates, contracts, advertising drafts etc. Interrogate databases worldwide, e.g. MIDAS, DIALOG, LEXIS, MEDLINE etc.

* **VIATEL, TELEBROKING, BULLETIN BOARDS, USER GROUPS.** etc.

* **VIATEL:-** Electronic mail, Instant telex at a fraction of the cost. Instant price updates as they occur on the stockmarket. Buy & sell shares with 1% brokerage fee! Home banking. Instant gambling on any race in Australia through VIATAB. Shop from home. Airline and hotel bookings. Home education courses. The possibilities are limitless and exponentially expanding. The modem adds a third dimension to your computer that opens up as you explore it. You have to experience for yourself the magic of clicking between Sydney, Los Angeles, New York, by modem.

Instantly, transparently and cheaply. Culling obscure facts. Interrogating mighty databases. Buying. Selling. Dazzling.

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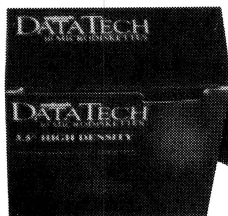
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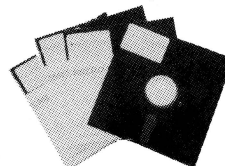
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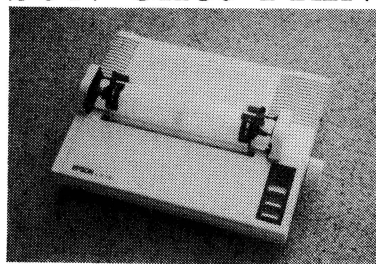
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Unix System

V/AT

MANY PC USERS HAVE been keeping a watching brief on Unix for the last few years. We've read about it in magazine articles; we've heard about the mind-boggling things university hackers can do with it; and we've seen Unix features added to MS-DOS. Yet, to date, there's disappointingly little Unix action out there. Why is this so?

First, let me discount one reason: that users are buying Pick systems instead. Pick and Unix are in no ways equivalent or even comparable. If Pick is attracting sales away from other operating systems, it is the single-supplier minicomputer operating systems that are hurting, not Unix.

The primary reason we are not seeing as many Unix systems out there as forecast is the current fascination the PC-user community has with networks. A few years ago, a small multiuser installation would have had to be a minicomputer or supermicro with an operating system like Unix; today, people are trying to build the same installation out of a number of PC's and a network.

Secondly, there's the lack of user-friendly applications software. *Perceived lack*, I should say. The stuff is out there; people just don't know where to find it.

Thirdly, there's the perceived user-hostility of Unix. Actually, it's not exactly hostile — Unix is simply prepared to believe that you're smarter than it is, and will follow your instructions, even when you're wrong. For example, under MS-DOS, if you type ERASE * * the operating system asks you to confirm that you really do want to erase everything. Under Unix, the equivalent command RM * just quietly goes about its business. If all software has to strike a balance between being easy to learn and use, and being sophisticated and powerful, then Unix leans towards the sophisticated and powerful. It favours experienced, 'power' users, not novices.

A final reason for the delayed introduction of Unix has been the dearth of machines powerful enough to run it. The

In the constant search for more power, users are looking at new operating systems to replace DOS. Les Bell has found a likely prospect (and 'it's staggeringly good value').

intro	introduction to commands and application programs
300	handle special functions of DASI 300 and 300s terminals
4014	paginator for the TEKTRONIX 4014 terminal
450	handles special functions of the DASI 450 terminal
accept	allow/prevent LP requests
admin	create and administer SCCS files
ar	archive and library maintainer for portable archives
as	common assembler
asa	interpret ASA carriage control characters
at	execute commands at a later time
awk	pattern scanning and processing language
banner	make posters
basename	deliver portions of path names
bc	arbitrary-precision arithmetic language
bdblk	print, initialize, update or recover bad sector information on disk packs
bdiff	big diff
bfs	big file scanner
brc	system initialization shell scripts
bs	a compiler/interpreter for modest-sized programs
cal	print calendar
calendar	reminder service
cat	concatenate and print files
cb	C program beautifier
cc	C compiler
chown	change owner or group
chroot	change root directory for a command
chri	clear i-node
cmp	compare two files
col	filter reverse line-feeds
comb	combine SCCS deltas
comm	select or reject lines common to two sorted files
config	configure a UNIX system
cp	copy, link or move files
cpio	copy file archives in and out
cpp	the C language preprocessor
cpset	install object files in binary directories
crash	examine system images
cron	clock daemon
crontab	user crontab file

Table 1. *The Unix commands — for a first-time Unix user, the first job is to get on top of the system before Unix gets on top of you. That really means you have to have a bit of system hacker mentality and be prepared to spend some time at least skimming through the manuals and gaining at least superficial familiarity with the 200 or so commands and utilities, a sample of which are listed here.*

ct	spawn getty to a remote terminal
ctrace	C program debugger
cu	call another UNIX system
cut	cut out selected fields of each line of a file
cxref	generate C program cross-reference
date	print and set the date
dc	desk calculator
dcopy	copy file systems for optimal access time
dd	convert and copy a file
delta	make a delta (change) to an SCCS file
devnm	device name
df	report number of free disk blocks
diff	differential file comparator
diff3	3-way differential file comparison
diffmk	mark differences between files
dircmp	directory comparison
dis	80286 disassembler
diskusg	generate disk accounting data by user ID
divvy	divide disk allocation between file systems
doscat	concatenate and print DOS files
doscp	copy files to and from DOS file systems
dosdir	emulate "dir" command for DOS file systems
du	summarize disk usage
dump	dump selected parts of an object file
ff	list file names and statistics for a file system
file	determine a file type
filesave	daily/weekly UNIX system file system backup
finc	fast incremental backup
find	find files
format	format floppy and hard disk tracks
frec	recover files from a backup device
fsck	file system consistency check and interactive repair
fsdb	file system debugger
fsplit	split f77, ratfor, or efl files
fuser	identify processes using a file or file structure
fwtmp	manipulate connect accounting records
get	get a version of an SCCS file
getopt	parse command options
getty	set terminal type, modes, speed and line discipline
grep	select terminal filter
grep	search a file for a pattern
help	ask for help
hp	handle special functions of Hewlett-Packard 2640 and 2621 series terminals
hpio	Hewlett-Packard 2645A terminal tape file archiver
hyphen	find hyphenated words
ib	install boot image
id	print user and group IDs and names
init	process control initialization
init-inittab	script for the init process
install	install commands
installit	package installation
ipcrm	remove a message queue, semaphore set or shared
mailx	interactive message processing system
make	maintain, update, and regenerate groups of programs
man	print entries in this manual
mesg	permit or deny messages
mkdir	make a directory
mkfs	construct a file system
mknod	build a special file
mount	mount and dismount file system
mkdir	move a directory
ncheck	generate names from i-numbers
newform	change the format of a text file
newgrp	log into a new group

original model PC/XT, for example, just can't cut it; its disk drives are too slow (the processor is border-line).

But with the introduction of the AT, and especially versions with fast processors and disk drives, we have a chance to run this new, large operating system. Of course, other microcomputers with fast processors and disk drives have been running Unix for years, but perhaps it would be naive of me to suggest that the blinkered PC-user community has been unable to see them. . .

Unix Ports

A number of Unix ports have been available for PC's for some time: Xenix, Venix, Qnix, PC/IX. Now there's a new kid on the block (one with a good pedigree, too) — Microport Systems' Unix System V/AT is a genuine AT&T-licensed Unix System V Release 2 for the IBM PC/AT and clones.

Some time ago, AT&T negotiated with the major manufacturers of 16-bit micro-

What is Unix?

Unix IS AN operating system, that is, the key program which permanently runs inside the computer and *a)* controls, and *b)* provides services for, all other running programs. Other computers have operating systems: IBM PC's have PC-DOS, their clones have MS-DOS, other machines use CP/M, Apple DOS 3.3 or ProDOS and so on. The Macintosh has the combination of the Finder (which controls the system) and the ToolBox (which provides graphics and other services).

However, all of these personal computer operating systems are single-user, that is, they enable a single user to run programs on a single PC. Larger computers are powerful enough to meet the needs of more than one user. This means that the operating system on such machines must be more complex and able to share the various parts of the computer system (memory, disk drives, files, and so on) between the various users. Such operating systems are multi-user and multi-tasking, and Unix and Concurrent DOS are examples of these. Various minicomputer manufacturers have their own operating systems, like DEC's VMS on the VAX and RSTS on the PDP-11, and Data General's AOS.

Unix is now the dominant operating system for multi-user minicomputers and supermicros, and is especially attractive to users who have seen the benefits of computers through their use of PC's, but need something a bit better organised and more powerful than more stand-alone PC's. □

Unix System V/AT

processors to port Unix to their machines. Intel elected not to do the port itself, but instead subcontracted to Microport (then a subsidiary of Digital Research) to do the job.

Microport went ahead and produced a version of Unix for Intel's System 86/30, which is their general-purpose development system box. Having completed the work, the powers that be at Microport realised that with a little bit of work, the port could be brought up on other iAPX 286-based machines — most notably the IBM PC/AT. Having negotiated a licence with Intel and AT&T, they brought it to market as System V/AT.

The Microport System V/AT package is derived directly from the AT&T-certified System V for the iAPX 286 processor. The utilities which make up the system were transferred directly onto the AT, without even being recompiled!

System V/AT has been unbundled, so that users can buy just what they need. The basic package is the Runtime System, which includes the kernel and over 200 utilities, together with a two-user licence. The Software Development System is two large manuals, together with the Unix Portable C Compiler, Fortran 77, efl and associated utilities. The Text Preparation System includes nroff, troff, spell, eqn, tbl, pic and other programs for documentation preparation and typesetting. A licence for more than two users is another option.

What perhaps most distinguishes Microport from other Unix systems is its pricing: under A\$1,000 for the whole setup, including the multi-user licence. Do *not* deduce low quality from the low price: Microport System V/AT is a high-performance, fully-featured product. It is effectively indistinguishable from V/2 running on a VAX or 3B machine, with the exception of the additional features.

System V/AT is supplied as a set of 1.2 Mbyte diskettes which can be installed onto an AT or clone. The user should first install DOS into a partition of the hard disk, leaving plenty of space for Unix.

Installation is very straightforward, and is performed by booting the system from a floppy disk, running the 'installit' shell script and responding to a series of prompts. The first job is to establish a partition for the system, which is done by the 'fdisk' utility. Interestingly, fdisk can deal with virtually any non-standard type of disk on an AT — the authors obviously recognised that users will want lots of disk

news	print news items
nice	run a command at low priority
nl	line numbering filter
nm	print name list of common object file
nohup	run a command immune to hangups and quits
od	octal dump
pack	compress and expand files
passwd	change login password
paste	merge same lines of several files or subsequent lines of one file
patch	inspect or modify an STL or COFF format binary file
pg	file perusal filter for soft-copy terminals
pr	print files
prof	display profile data
profiler	operating system profiler
prc	print an SCCS file
ps	report process status
ptx	permuted index
pwck	password/group file checkers
pwd	working directory name
ratfor	rational Fortran dialect
regcmp	regular expression compile
rjestat	RJE status report and interactive status console
size	print section sizes of common object files
sleep	suspend execution for an interval
sno	SNOBOL interpreter
sort	sort and/or merge files
spell	find spelling errors
split	split a file into pieces
stlboot	system load bootstrap program
strip	stripsymbol and line number information from a common object file
stty	set the options for a terminal
su	become super-user or another user
sum	print checksum and block count of a file
sync	update the super block
sysdef	system definition
tabs	set tabs on a terminal
tail	deliver the last part of a file
tar	tape file archiver
tee	pipe fitting
test	condition evaluation command
tic	terminfo compiler
time	time a command
timex	time a command; report process data and system activity
touch	update access and modification times of a file

Benchmark:	Sieve	Sort	fib	float	matmult	dhame
Compile time -						
real	9.60	16.40	9.70	12.50	15.80	22.20
user	3.30	8.80	3.30	4.10	7.70	14.00
sys	3.10	4.00	3.50	5.10	4.80	4.30
Size	14512	19072	14498	14536	15176	17360
Run Time -						
real	29.60	5.30	13.50	526.00	33.40	14.50
user	28.40	4.30	13.00	3.90	0.40	8.70
sys	0.20	0.70	0.10	518.10	32.60	5.30

space. The system requires a minimum of around 16 Mbytes of disk space to run. Once fdisk has run, 'divvy' and 'mkfs' will

set up the /root and /usr file systems, and will allocate space for the system swap area. You may optionally allocate space

for a /tmp file system.

Once this activity is over, the shell script copies various files to establish a minimum system on the hard disk, and then shuts the system down. When the system is rebooted, it will load from the hard disk. Now the remaining files in the run-time system can be installed by a similar shell script procedure, and then the system logs you out. From now on, you will have to log in (initially as super-user — ah, the power!) before continuing.

Installation of the software development and text preparation systems is similar. The whole process is not nearly as complex as I'd imagined bringing up a Unix system to be. Of course, the fun has only started — now you have to perform a variety of system administration and maintenance tasks. Not all of them are complex, but there are a lot of detailed steps, and the documentation is decidedly thin at this stage. Previous experience with Unix, or the assistance of another Unix system administrator, is a great help.

In Use

Microport Unix System V/AT is a complete Unix system. That makes it rather like a complete MS-DOS system: you can edit some text files, print them, and that's about it. Of course, there are many more utilities than with MS-DOS, and the options provide you with software development and typesetting capabilities.

For a first-time Unix user, the first job is to get on top of the system before Unix gets on top of you. That really means you have to have a bit of system hacker mentality and be prepared to spend some time at least skimming through the manuals and gaining at least superficial familiarity with the 200 or so commands and utilities (see Table 1). Perhaps the most important are the commands which correspond to simple DOS or CP/M functions —

DOS	UNIX
DIR	LS
TYPE	CAT
COPY	CP
ERASE	RM
RENAME	MV
CD	CD and PWD

— together with some more complex and essential commands like 'fsck', which does for Unix systems what chkdsk does for DOS (and then some).

Perhaps the most frequently used pro-

What perhaps most distinguishes Microport from other Unix systems is its pricing: under A\$1,000 for the whole setup, including the multi-user licence.

gram, at least at first, is 'vi', the full-screen editor. Vi, is unfortunately, a moded editor of rather ancient design — it works, and works tolerably well, but it's not the easiest to learn and use. Nonetheless, bringing up a Unix system involves editing a lot of text files, and the alternatives to vi are 'ed' and 'edit', both line editors which would make any moderately experienced user throw up — although I am surprised at the number of people I thought would know better who use edlin (really experienced guru-type users, of course, know that there are reasons for using ed)!

For users making the transition from DOS, Microport System V/AT provides some assistance in the form of the 'dosdir' and 'doscp' commands, which will display a directory of, and copy files to and from, MS-DOS disks. Users who have been developing software in C, and who have been careful about keeping their code portable should find that moving their code across to Unix is a snack.

The package provides a number of advanced features. In particular, it comes with both the C shell and the Bourne shell, and the sh1 shell layering feature is included but not supported currently, although it will be supported in a future release. In addition, the system supports virtual consoles in the same fashion as Concurrent DOS, providing an exceptionally convenient way for a user to take advan-

tage of the multi-tasking features of Unix. Pressing Alt-F1, -F2, -F3 or -F4 will switch to the appropriate virtual console, or SysReq switches through them sequentially (that makes two packages that now use SysReq!).

The system is memory hungry. I used it on a 8MHz AT clone with 3 Mbytes of RAM. Most of that is used as swap space to improve the performance of the system — running it in a 640 Kbyte machine, while possible, would not be comfortable! As Microport say, 'Performance improves markedly as memory is added to the system.'

The system incorporates a hardened file system which performs sanity checks as the system is brought up and will repair a damaged file system. In addition, Microport have modified the system so that, while a shutdown shell script is provided, one may also shut down by simply pressing Ctrl-Alt-Del. Experienced Unix users won't feel comfortable with this procedure, but it does work! We had no problems with file system corruption of any kind while using the system.

Performance is surprisingly good, as the benchmarks show. The system feels responsive and not nearly as sluggish as some other small Unix systems we have used. Disk activity is noticeably higher than DOS systems, however.

Software support for the Microport Unix is on the up and up. It is binary compatible with both the Intel Unix and with the AT&T 6300 Unix implementation, and binary compatibility with Xenix is promised in the near future. Already, many well known products, such as Informix, are available for the system. An 80386 version is also in the works (possibly with MS-DOS running as a sub-task?).

Overall, we were very impressed with Microport System V/AT. It is a stable, well-constructed product with very good performance, and at the price represents staggeringly good value. □

Product Details

Product:	Unix System V/AT
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IT'S A

GENIUS

of a genealogy program

Good software is where you find it! Xidex are currently including three PC-DOS programs on one of the floppies when you buy a box of 10. The programs are changed every three months, but they always include a game, a business-oriented program, and 'something' different.' Shane Baker reports on one of the somethings different . . .

I HADN'T TRIED ANY of the offerings from Xidex until a few weeks ago. Until then, I was skeptical, to say the least, and assumed the programs would be the sort of thing that could be knocked over (and gotten bored with) in a Sunday afternoon. I was wrong!

Far from being just a couple of shabby little programs, the disk was full with: Elevator (a game), Debtor (an accounts receivable package), and Genius. All of the software offered on the disks is written by The Wordworks, of Canberra.

Elevator is a good little game, and like all effective computer games, it's deceptively simple in concept, but challenging to master.

I know little about accounting packages and have no use for one, but if Debtor is of the same quality as the other programs of-

fered, it should prove useful (and good value).

But — the program I found *useful* is Genius, a genealogy program.

I guess my family is like many others: various people have pecked away at the family tree over the years, but the problem has always been organising and storing the data in a useful way. (I had intended writing a package myself, but 'hadn't got around to it, yet' — I'm glad I didn't bother, because Genius does all that I had planned, brilliantly).

Genius stores the following data —

Full name,
Previous Family Name,
Sex,
Title,
Free-form Notes,
Dates and Places of Birth, Death,
Baptism and Burial,
Marriage details (including the capacity to cope with multiple marriages), and
Free-form Marriage Notes.

I guess the thing that separates a genealogy program from a generic database is that it must handle relationships. Genius does this simply and effectively by allowing the creation of a record which simultaneously incorporates the entry's relationships. For example: having created the first record, you may then add a parent, child, sibling, spouse, or unrelated person. The tree is built up from there.

One can also 'connect' or 'break' any

person from some or all of their relations, easily, quickly and at any time. The screen layout comprises 3 lines of records as shown in Table 1.

Having created the records, one then moves around the family tree using the key pad. Starting with the selected person, one can move to that person's father by pressing the up arrow. Alternately, the mother is selected with page up. The selected person's spouse is always displayed on the left of the screen, and, naturally enough, is selected with the left arrow. Siblings, to the right, are selected with the right arrow key. Children are displayed on the lower line, and are selected using End, the down arrow, or page down. Easy enough?

The screen display shows additional marriages, additional siblings or the existence of other children by a dotted line leading from the solid lines indicating relationships. Additional siblings or children are tracked down using the cursor keys, whilst other marriages (and the offspring of those marriages) can be revealed with the F10 key.

Actually, the screen layout is excellent, but a little disconcerting at first. Although it follows a standard pedigree chart (used for everything from budgies to people), it displays according to relationships — without all the limitations of charts on paper. (Genius is a very good example of the possibilities of a completely *flexible* screen-based information display).

The way to find an entry in the family

Father		Mother
Spouse	Selected Person	Sibling
Child 1	Child 2	Child 3

Table 1. The screen layout of The Wordworks's Genius.

It's a Genius

This software is genuinely user-friendly. Some online help is available, but more importantly, the program is genuinely intuitively obvious.

tree, is to 'Select.' By pressing 'S,' you can select all people in the database with a particular set of attributes. For example, by entering SMITH in a field, the system produces a list of all people with that string of characters in that field (including SMITHE or HAMMERSMITH). All fields allow the use of '?' as a wildcard — Genius responds by producing a window showing the name, and dates of birth and death for all records which meet the wildcard search criteria.

An entry is selected by moving the cursor to the appropriate person and pressing ENTER.

Reports

A program like Genius is only as good as its reports, of course. A total of eight printed reports are available. These can be selected for one person only, for a group (selected using the the S command) or for all records. The possibilities are —

Full details of a record(s),

Brief details

(Name, date of birth, and so on),

Notes (free-form),

Marriage details,

Marriage notes,

Pedigree Chart

(selected person and spouse, parents and grandparents.),

Descendants Report

(three to eight generations),

A Blank pedigree form.

All reports are available only in printed form. (An option for screen reports would be nice, but how do you get all that detail on a standard 80 x 24 screen?).

The reports are all comprehensive. For example, a Full or Brief details report offers the option of a list in alphabetical order, with the entries listed both by current family name, and previous family name. Such a report is invaluable when ploughing through archive material.

Documentation

Despite the fact that any decent review must comment on the printed documentation — I can't. A manual is available from the authors for \$25, but we (my wife and I) haven't felt the need for it.

This software is genuinely user-friendly. Some online help is available, but more importantly, the program is genuinely intuitively obvious.

Summing Up

Judging by prices for genealogy programs quoted in Software on the Cheap (YC, August '85), a minimum price of \$150 for Genius wouldn't be unreasonable. As it is, if you can still find the right box of Xidex discs, you get it for free.

If you can't, The Wordworks will sell you a copy (including a manual) for about \$60.00. The program is available in two versions: a floppy disk version with a capacity for 500 entries, or an hard disk version, which can cope with 3,500. Both run on IBM and alikes — mine is the 'standard' Taiwanese clone running PC-DOS 3.1).

A word of warning: Genius is not public domain. Ownership remains with The Wordworks.

Xidex is to be offering a Creditor's Ledger, Disk Utility and another game as part of their next release of 10 disk boxes in April or May. This will also be available through The Wordworks. □

Product Details

Product:	Genius
Review Copy From:	A box of Xidex 5 1/4 inch floppy discs
Retail Sales:	The Wordworks The Boulevard, City Walk, Canberra 2600 ACT (062) 57 2893
Price:	\$60 Software and Manual \$25 Manual only

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SOURCE PRINT — a source form

If you're programming in C, Basic, Pascal, dBase or Modula-2, let Ewart Stronach tell you about this handy utility that can make life easier...

SOURCE PRINT WAS DESIGNED to make life easier for the professional software developer, but anyone writing their own programs in C, Basic, Pascal, dBase or Modula-2 will find it a handy time-saver. Since it

automatically takes care of much of the repetitive 'monkey-work' associated with programming, it could even be handy for the novice programmer.

Source Print operates as a filter, transferring all or selected portions of an input

file to an output file. The output may be to the printer, the terminal or a new disk file. It offers a wide variety of formatting selections and will operate on any text file — if you're running an IBM (PC, XT or AT) with DOS 2.0 or a later version.

The utility offers a range of 29 options plus six embedded commands. Page headings may be printed with your listing to show the page number, total number of pages, current time and date, the last modified time and date, the current proce-

Figure 1. In dBase mode (II, III and III Plus are supported), Source Print offers line numbering, pagination, bold keywords and structure outlining.

```
07-29-86 13:41:40 demo.prg
09-13-86 16:13:58 update inv. date

Pg 1
of 2
1-55

1 * This is dBASE code to demonstrate Source Print
2 *
3 *
4 use partfile index partprsu,partengn
5 set talk off
6 BAD = .F.
7 do inits
8 *
9 n=peek(1024+tail)
10 c=peek(1025+tail)
11 if LAST_INV > date()
12 FU=.T.
13 replace LAST_INV with date()
14 c=0
15 endif
16 if IN_STOCK<>IS
17 replace LAST_INV with date()
18 endif
19 @3,50 say space(30)
20 if n<>0
21 c=0
22 endif
23 do case
24 case c=73
25 skip -1
26 if bof()
27 skip
28 skip -1
29 endif
30 case c=81
31 skip
32 if eof()
33 skip -1
34 endif
35 case c=120.or.c=121
36 REC=recno()
37 SRCH='
38 if C=120
39 set index to partengn,partprsu
40 endif
41 do while REDO
42 tail=peek(1052)-2
43 if tail<30
44 tail=60
45 endif
46 c=peek(1025+tail)
47 NOS=(C=81.or.C=73.or.C=117.or.(C>=120.and.C<=129))
48 if NOS
49 REDO=.F.
50 SRCH=space(10)
51 endif
52 @2,66 say
53 SR=upper(trim(SRCH))
54 if len(SR)>0.and..not.NOS
55 find &SR
```

```
07-29-86 13:35:44 demo.mod Capacitor Analyzer
09-13-86 16:33:09 polarization

1 (* This is a set of Modula-2 routines to demons
2
3
4 MODULE CapAnalyzer; (* <T>Capacitor Analyze
5
6 FROM inout IMPORT write, writestring, writeln,
7 FROM storage IMPORT ALLOCATE,DEALLOCATE;
8 TYPE pnode = POINTER TO node;
9 node = RECORD
10 voltage:CHAR;
11 capacitors,
12 resistors:pnode;
13 END;
14 VAR
15 current:pnode;
16 ch:char;
17 PROCEDURE polarization(VAR scurrent:pnode);
18 VAR
19 impedance, reactance:pnode;
20 first:BOOLEAN;
21 BEGIN
22 FOR i := 0 TO 4
23 DO
24 j := j + j
25 END
26 read(ch);
27 IF ch <> accuracy THEN
28 first := TRUE;
29 REPEAT
30 impedance(impedance);
31 WITH impedance^ do
32 voltage := ch;
33 capacitors := NIL;
34 resistors := NIL;
35 END;
36 IF first THEN
37 scurrent := impedance;
38 first := FALSE;
39 ELSE
40 reactance^.resistors:=impedance;
41 END
42 reactance := impedance;
43 read(ch);
44 IF ch = tolerance THEN
45 polarization(impedance^.capacitors);
46 END
47 read(ch);
48 UNTIL ch = accuracy;
49 END;
50 END polarization;
51
52 PROCEDURE probe(vcurrent:pnode);
53
54 BEGIN
55 IF vcurrent <> NIL THEN
```


ating utility

dures or functions, and the range of source line numbers on the page.

Source Print will format individual lines and there's an option to specify the page width and another to give double spacing. Lines too long for the page width are automatically continued with the text correctly indented and the line broken at the end of a word (or between statements if you're working with source code). There's a Table of Contents feature that generates a listing of functions and procedures, as well as showing titles and subtitles embedded in the source file.

One of the handiest features is the ability to extract parts from up to 16 source

files (specified by function or procedure). for printing to a new file — this makes it very easy to maintain a source library of useful routines.

The Structure Outline feature automatically draws lines on the printout or screen that connect the beginning and end of nested control structures — this makes it easy to follow complex structures that go on for pages. Reserved words from each of the languages supported are automatically highlighted when printing and you

can define your own 'key' words. Page eject commands can be embedded in the file, the page depth specified and tab settings arbitrarily defined.

What can't it do? Well, it can't handle input files with more than 65,530 lines, or input lines with more than 512 characters, or more than 1000 pages from one 'format', or title lengths longer than 50 characters — if none of these are a problem, Source Print can be a very useful addition to any programmers tool kit. □

Product Details

Product:
Manufacturer:

Source Print
Aldebaran Laboratories Inc.
Lafayette, California
Hypec Electronics Pty Ltd
21 Ryedale Rd,
West Ryde 2114 NSW.
(02) 808 3666
\$175 plus tax

Review Copy From:

Price:

Pg 1
of 2
1-55

trate Source Print *)

*)

read;

Figure 2. Modula-2 mode gives pagination, line numbering, bold keywords, and structure outlining.

```
07-29-86 13:37:46 demo.c Boldface routines Pg 1
09-13-86 16:30:56 of 2
1-55

1 /* This is a set of C routines to demonstrate Source Print */
2
3
4 /* <t>Boldface routines */
5
6
7 dobold (iar)
8 int iar;
9 {
10 char c, d, *p;
11 int i, j, good;
12
13 iar--; c = tou
14 good = 0;
15 if (nboldln >=
16 while (iar
17 {
18 if ((d = a
19 {
20 p = &(
21 while
22 { p++;
23 }
24 }
25 if ( *
26 {
27 }
28 }
29 ia
30 }
31
32 if
33
34
35
36
37
38
39
40
41
42
43
```

Figure 3. As this demonstration page shows, in C mode, Source Print gives pagination, line numbering and structure outlining.

Figure 4. Pascal mode offers line numbering, bold keywords, and structure outlining.

Figure 5. The Basic mode gives pagination, automatic indentation, and bold keywords — structure outlining (not shown) is also supported.

```
07-29-86 13:36:20 demo.pas Sorting Routines Pg 1
09-13-86 16:19:14 sorta of 2
1-55

1 (* This is a set of Pascal routines to demonstrate Source Print *)
2
3 (* <t>Sorting Routines *)
4
5 procedure sorta;
6 var j, a, b, x: integer;
7 list: array[0..1000] of integer;
8 begin
9 a := 1; b := 1000; x := 0;
10 repeat
11 if b > a then
12 begin
13 j = part (a, b);
14 if (j-a) > (b-j) then
15 begin
16 list[j] := a;
17 list[j+1] := j;
18 a := j+1;
19 end
20 else
21 begin
22 list[j] := a;
23 list[j+1] := j;
24 a := j+1;
25 end;
26 x := x+2;
27 end
28 else
29 begin
```


Diskit 2 Plus

— 20 megabytes of hard disk backup plus security



Ewart Stronach has found the answer to every data manager's paranoia — so if you've got megabytes of secrets that you want kept, read on . . .

IMAGINE THE advantages of having a pair of 10 megabyte floppy disk drives that take up no additional space on your desk. This is exactly what Diskit2 Plus offers the owners of a PC, XT or AT.

The package consists of a full-sized controller board with a cable that looks strong enough to carry ten kv, linking it to a unit which looks like a very thick barbecue plate. The case measures 2.2 inches high, 13 wide and 15.2 wide and is cast in a very heavy metal complete with a series of non-slip, diagonal grooves running across the top of it. The disk doors look just like half-height floppy drives with a square push button that opens the whole front section for insertion of the Winchester cartridge. Diskit2 Plus is designed to sit on top of your PC under the monitor, therefore taking up no additional space — it has a 'zero footprint,' as the copywriters say. The cartridges look rather like large versions of 3.5 inch floppies, but they contain a full hard disk plate.

Installation of the controller card is as simple as your PC will allow. More time will probably be spent getting the case open and re-assembled than actually mounting the card. The linking cable is, as I mentioned, very heavy indeed, and carries a 62 way connector at either end.

The length of this cable is just enough to mount the unit where the manual suggests, or on the desk to the left of your PC. The connectors are identical at both ends so there's no chance of mismatching during setup. Setup instructions are provided on a poster with 10 pictorial steps including case removal for a regular IBM. The only pause for thought is when you must decide if you want to configure Diskit as hard drive one or two and then set a pair of dip switches accordingly.

It's Polite!

As my machine already boasts a 20 Mbyte hard disk, I elected to run the test unit as hard drive two. With the hardware installed without problem, software installation is as simple as placing the installation disk in drive A and typing the magic words INSTALL. The installation program is menu driven and it's polite enough to tell you everything it's doing. The first step is a series of diagnostic tests before it turns on the new disks. Then it looks for an additional controller board and checks that no incompatibility exists with your dip switch settings. It then checks its own controller board, cables and the two drives. When activated, the drives first display a red LED on the front panel which

flickers and turns green as the drive reaches operating speed. Each drive is checked for operation and INSTALL checks that the drives are readable by DOS.

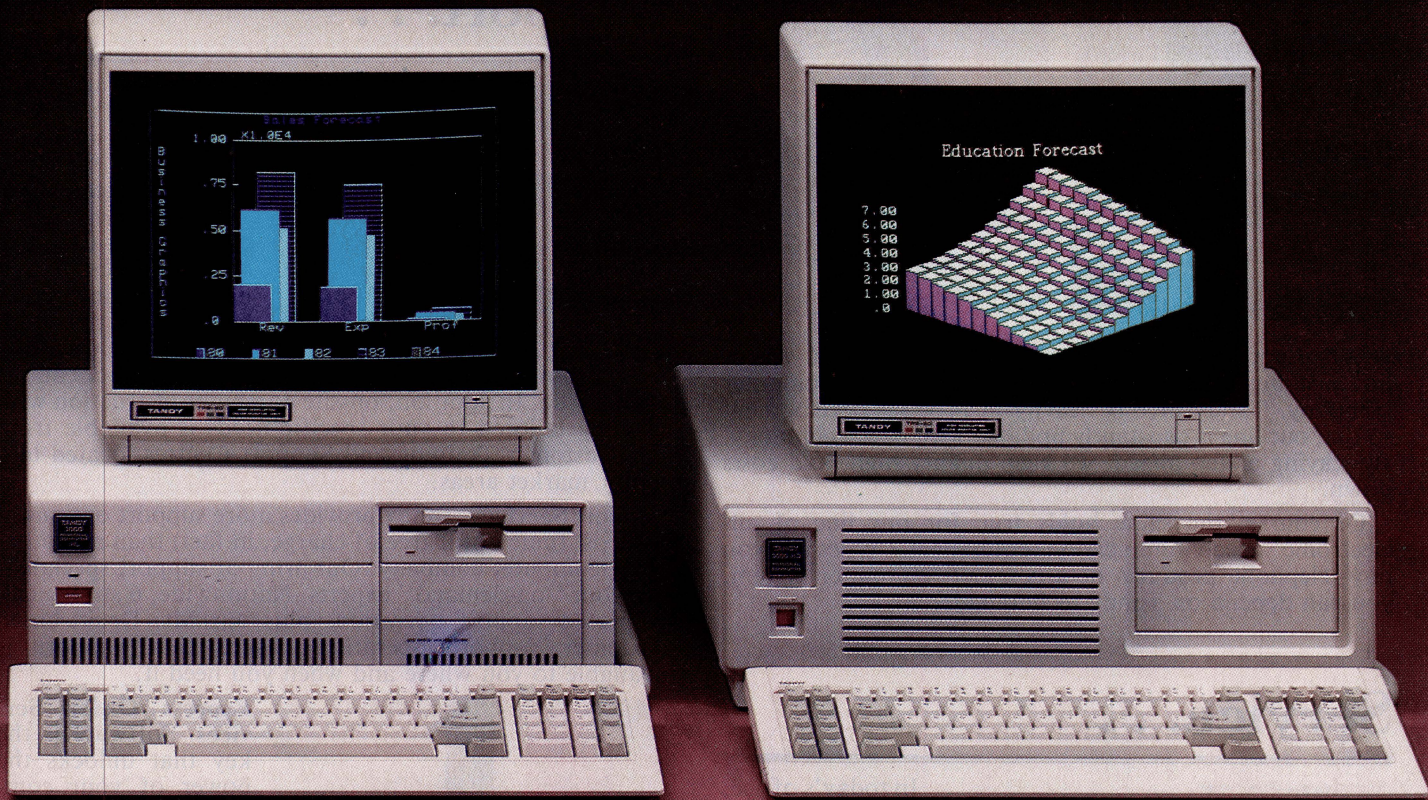
If there were no hitches in the diagnostics, you are offered the opportunity to make either your internal or external hard disk bootable. I elected to retain the *status quo* as, regretfully, the test unit is expected back as soon as I finish this review. Your system may now be rebooted to finally check all is in order. Mine was, and I was greeted by a message which indicated that a device driver had been added to my config.sys file and both disks were being automatically recalibrated and loaded with a final note of how many logical drives I now possessed.

After the install instructions, the manual proceeds with about 10 pages of every possible error message which might occur during the setup procedure and how to handle it. As with any normal hard disk, Diskit may be partitioned for different DOS' and the partitions treated as separate logical drives. Cartridge formatting is handled by a utility file called DUTIL, but the majority of housekeeping is done with normal DOS commands (DOS versions 2.0 to 3.1 are supported). The next section of the manual covers normal operation of the unit and includes the suggestion that you maintain three backup cartridges for each drive in regular use. There are two cartridges supplied with the unit, so that suggestion could cost an extra \$1,200.

The utility program DUTIL is menu-driven and offers the following selections — F1: Test drive; F2: Bad sector scan; F3: partition drive functions; F4: DOS format drive; F5: Copy system files; and F6: Re-build drive. The only thing left for me to do was format the drive and this took a little over 10 minutes. The test sequence is non-destructive and may be run at any time if you have reason to suspect a cartridge problem. The diagnostics section of the DUTIL program are the same as those used during setup but may be selected from a menu. Full information for running the utilities are clearly provided in the manual, although the menu and message reporting on-screen make referral to the manual a rare occurrence.

The messages are clear and unequivocal, such as Switch 7 of the controller card is on, indicates that INSTALL has found another controller card in your computer and refuses to proceed until it is made compatible.

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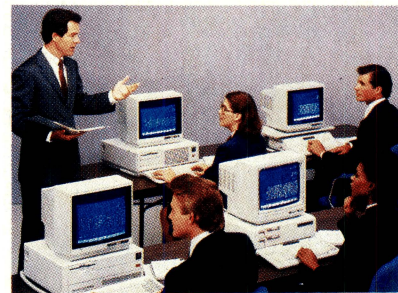
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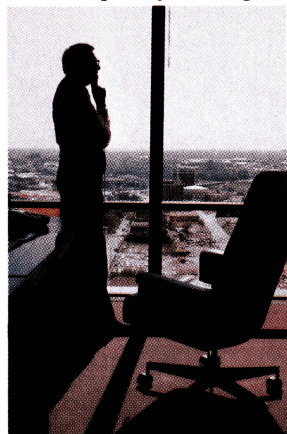
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Multitasking, Multiuser Capacity

The Tandy 3000 is designed to use the XENIX 5.0 multiuser operating system. In such a configuration, multiple display terminals will be able to tap the high-performance 80286 microprocessor. Thanks to its high processing speed, two to six users throughout an office will be able to use the Tandy 3000 simultaneously. Each user can work independently on such products as accounting, word processing and electronic filing. All of the users can share the Tandy 3000's accessories, eliminating the need for a printer or modem at each workstation.

Thus, each remote user has the power of a fully configured computer system for the price of a terminal.

Designed for High Performance

The Tandy 3000's 16-bit architecture operates at 8 megahertz. It features 512K main memory and a high-capacity 13.3cm slim-line floppy disk drive. For compatibility, this drive can read 1.2-megabyte and 360K formats for use with IBM PC diskettes.

For maximum storage capacity, the Tandy 3000 HD has in addition to the floppy drive a built-in 20-megabyte hard disk drive for fast access to volumes of important data.

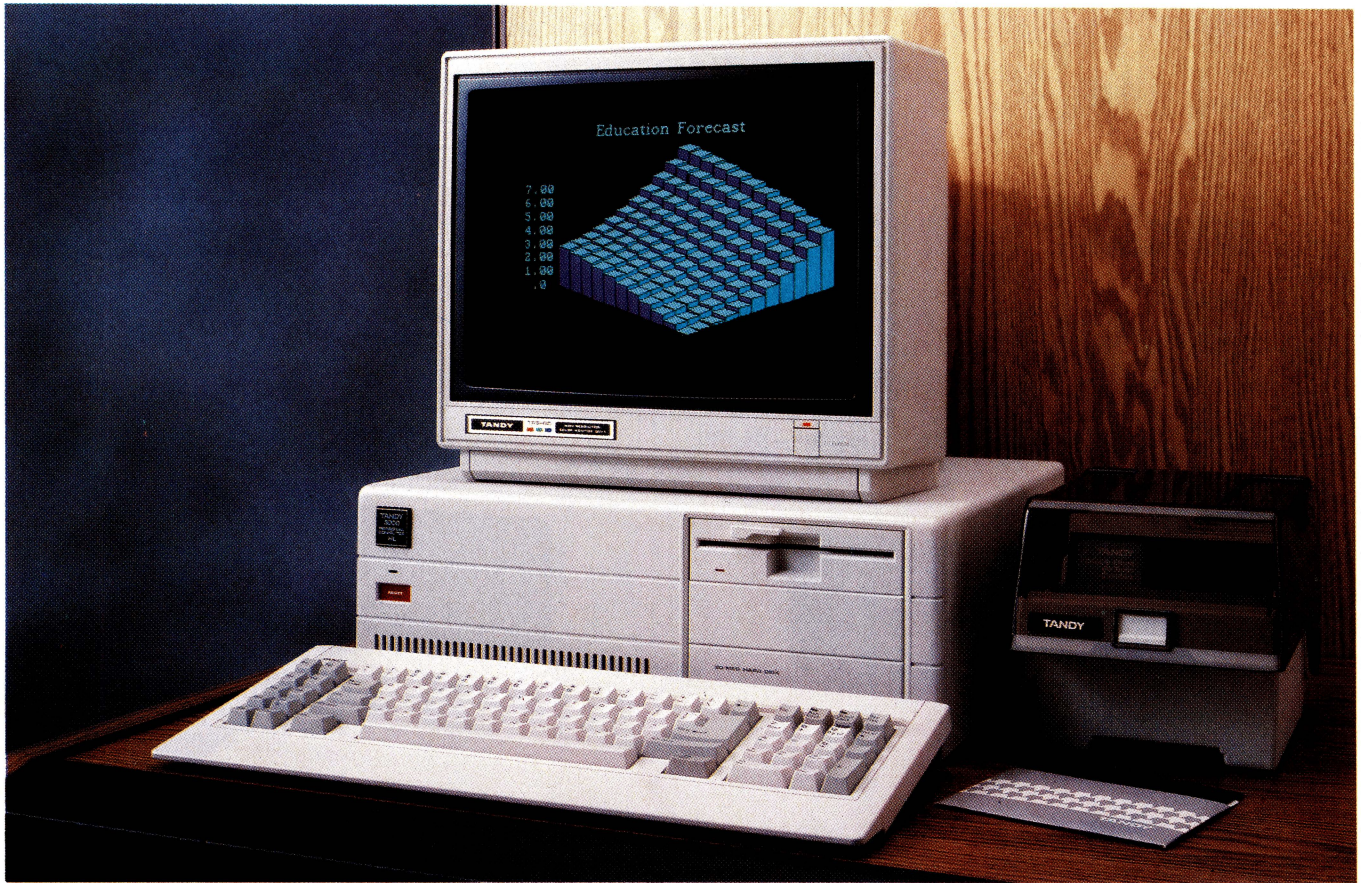
A serial/parallel adapter is standard, making Tandy 3000 ready to interface with peripheral devices like telephone modems, printers and plotters.

The Tandy 3000 is equipped with ten expansion slots, including seven PC/AT-compatible slots, two PC/XT-compatible slots and a PC/XT-compatible half-slot for the serial/parallel adapter.

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MS-DOS™ (3.1)/BASIC. Comes with our exclusive DeskMate® II 6-in-1 software. 25-4101	229.95
XENIX Sys. V Operating System. 25-4201	1199.00
XENIX Sys. V Development System. 25-4202	999.00
XENIX Sys. V Text Processing System. 25-4203	299.00

SPECIFICATIONS. Microprocessor: Intel 80286 processor with 16-bit data path. Clock speed, 8 MHz. Object code compatible with 8086/8088. Real-time clock with battery backup. **Operating System:** Optional Microsoft MS-DOS 3.1 with BASIC. **Memory:** 512K RAM with parity. By using the expansion slots, memory is expandable to 12 megabytes under XENIX. Includes power-up diagnostics. Sound included. **Keyboard:** 84-key sculptured, including numeric entry keypad. Special keys include ESCape, Num Lock, Alt, Ctrl, Caps Lock, Prt Sc, Sys Reg, Scroll Lock, Up, Down Right and Left arrows. Ten programmable Special Function keys. Retractable legs, 1.8M coil cable. **Video Display:** Optional high-resolution, non-glare, non-interlaced 30.4cm monochrome (green) or 35.6cm color monitor 80 or 40 characters per line by 25 lines or 50 lines. Optional high-resolution 640 x 200 monochrome graphics and 320 x 200 graphics in 16 colors, or 640 x 200 graphics in 4 colors. **Disk Drives:** Built-in high-density, thin-line 13.3cm floppy can read 1.2Mb and 360K formats. Tandy 3000 HD also has built-in 20 megabyte hard disk drive. Disk storage is expandable to include two floppy disk drives and one hard disk drive, or one floppy disk and two internal hard disk drives. Total internal storage capacity can exceed 40 megabytes. **Internal Expansion:** 10 plug-in card slots, including 7 PC/AT-compatible slots, 2 PC/XT-compatible slots and 1 PC/XT-compatible half-slot for the serial/parallel adapter. Optional 80287 math co-processor can be added. **External Connections:** Standard parallel printer port, RS-232C serial communications port, AC outlet. **Dimensions:** 16.5 x 48.3 x 45.7cm. **Weight:** 21.3kg. **Power Requirement:** 240V AC, 50Hz.

3000 HL — TWICE THE XT POWER



NEW
FOR 87

1-Disk Tandy 3000 HL

3999 00

Monitor, adapter and hard disk not included

If you've already invested in IBM® XT software and hardware, yet are shopping for a lower-priced compatible, then take a look at our newest computer to join the Tandy line of IBM compatibles, the Tandy 3000 HL.

The Tandy 3000 HL is the basic building block of business systems. It was created to be fully compatible with IBM XT's, and then we made it even better.

First, we made it faster. With an 80286 processor, it's over twice as fast as the XT. And that's good news for busy people. Then we made sure the Tandy 3000 HL has plenty of memory to run the software you and your staff have grown accustomed to. The Tandy 3000 HL comes with 512K standard memory and can be expanded to 4 megabytes using the expansion slots. You can choose from advanced word-processing packages and heavy-duty database management to accounting software. And because the Tandy 3000 HL uses most popular MS-DOS packages that are available off-the-shelf, you can get all the software you need, when you need it.

A Computer That Can Expand—Inexpensively

Because we know how quickly your business can grow, we made sure the Tandy 3000 HL has room for fast, low-cost

expansion. It comes standard with seven expansion slots; four 8-bit/XT compatible slots and three 16-bit data bus slots. And for better office efficiency, the Tandy 3000 HL features a built-in real-time clock with battery backup for automatic date and time-stamping of all jobs, process control and other time-sensitive applications.

We also remember how much time is spent composing memos, calling meetings and writing reports. And because networking is quickly becoming one of the biggest concerns for current computer owners, we made the Tandy 3000 HL network compatible with all MS-DOS computers. Now with the Tandy Vianet local area network, you can connect your existing MS-DOS based computers to the Tandy 3000 HL and continue to communicate with your staff, while spending much less. It will be easier than ever before to pass a document around your company for comments and refinements, producing a finished version that not only costs less but contains better information. You can send memos, figures and other important messages via computers, eliminating lost memos, forgotten meetings or incomplete reports.

For XT compatibility with more power and versatility, at a much lower cost, this is the computer to step up to.

Tandy 3000 HL. 25-4070.....	3999.00
20 Megabyte Hard Drive. 25-4062	1799.00
Hard Drive Controller. 25-4060	1199.00
MS-DOS 3.2/BASIC/DeskMate II. 25-4103	199.95

SPECIFICATIONS. Microprocessor: Intel 80286 processor with 16-bit data path. Switchable clock speed, 4/8 MHz. Object code compatible with 8086/8088. Real-time clock with battery backup. **Operating System:** Optional Microsoft MS-DOS 3.2 with BASIC. Memory: 640K RAM with parity. By using the expansion slots, memory is expandable to 4 megabytes. Includes power-up diagnostics. Sound included. **Keyboard:** 84-key sculptured, including numeric entry keypad. Special keys include ESCape, Num Lock, Alt, Ctrl, Caps Lock, Prt Sc, Sys Reg, Scroll Lock, Up, Down, Right and Left arrows. Ten programmable Special-Function keys. Retractable legs, 1.8M coil cable. **Video Display:** Optional high-resolution, non-glare, non-interlaced 30.4cm monochrome (green) or 35.6cm color monitor 80 or 40 characters per line by 25 lines. Optional high-resolution 80 characters by 50 lines, 640 x 200 graphics and 320 x 200 graphics in 16 colors, or 640 x 200 graphics in 4 colors. **Disk Drives:** Built-in thin-line 13.3cm floppy can read 360K formats. Disk storage is expandable to include two floppy disk drives and one hard disk drive or one floppy disk and two internal hard disk drives. Total internal storage capacity can exceed 40 megabytes. **Internal Expansion:** 7 plug-in card slots, including three 16-bit slots, four PC/XT-compatible slots. Optional 80287 math co-processor can be added. **External Connections:** Standard parallel printer port. **Dimensions:** 33 x 50.8 x 55.9cm. **Weight:** 14.5kg. **Power Requirement:** 240V AC, 50Hz.

THE TANDY 2000 COMPUTER



2-Disk Tandy 2000

10-Meg Tandy 2000 HD

999⁰⁰

3999⁰⁰

Special offer while stocks last

Monitor and graphics options not included.

High Technology . . . for Less

Like the IBM PC/AT, the 256K Tandy 2000 performs two to three times faster than the IBM PC. Each Tandy 2000 disk drive offers twice the storage of an IBM PC drive, but still reads and writes their format. Our color graphics are twice the resolution of COMPAQ or IBM, and offer twice as many colors. And all four of our user-accessible card slots are available for future growth. Check out the Tandy 2000 . . . we invite comparison!

Advanced Color Graphics

The Tandy 2000's high-resolution graphics let you create razor-sharp charts, graphs and diagrams in a brilliant array of colors. And by adding our computer-aided design (CAD) software and graphics peripherals, the Tandy 2000 offers minicomputer performance at an exceptional low price.

Extremely High Speed

An 80186, true 16-bit CPU makes the Tandy 2000 dramatically faster than other MS-DOS computers. That means Tandy 2000 software runs faster, so you get the job done quicker.

Vast Storage Capacity

The Tandy 2000's two floppy disk drives let you store more documents and crunch through bigger tasks with ease. For even greater storage, the Tandy 2000 HD features a built-in 10-million-character hard disk drive.

Large Library of Proven Software

The industry standard MS-DOS operating system lets us bring you the most popular and sophisticated programs on today's market. Programs like Lotus 1-2-3, dBASE II, Multiplan, pfs:file, MultiMate, SuperCalc[®] and many more. You can even exchange data between the Tandy 2000 and an IBM PC, using PC Maker[™] (included at no charge). With PC Maker, you can create a disk that you can load and read on an IBM PC. You can also read PC disks on the Tandy 2000.

Compare the Tandy 2000 to the IBM PC and PC/AT

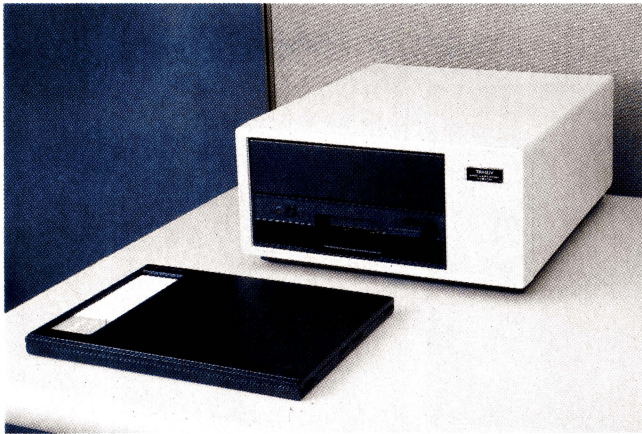
Feature	Tandy [*] 2000	IBM [*] PC	IBM [*] PC/AT
Microprocessor	80186	8088	80286
Clock Speed	8 Mhz	4.7 Mhz	6 Mhz
RAM Standard/Maximum	256/768K	256/640K	256/3 MEG
# Drives/Capacity	2/720K	1/360K	1/1.2 MEG
Monitor Support	Mono	Option	Option
Printer Adapter	Included	Option	Option
Optional Graphics	640 x 400	320 x 200	640 x 350
RS-232 Adapter	Included	Option	Option
Price — CPU only (Mfr.'s list as of 30/6/86)	\$999.00	\$3472	\$7653

Tandy . . . Clearly Superior[™]

At \$7653, a similar PC/AT configuration is \$6654 more than a 2-disk 256K Tandy 2000. Add expansion memory, stunning high-resolution monochrome and color graphics, our Digimouse[™] and more. And you can install most of these options yourself. Putting it simply, the Tandy 2000 delivers extraordinary quality performance at a remarkably low price.

256K 2-Disk Tandy 2000. 26-5103 999.00
10-Meg Tandy 2000 HD. 26-5104 3999.00

10-MEGABYTE DISK CARTRIDGE SYSTEM



Ideal As Primary Disk Storage or For Backup

4999⁰⁰

10-Megabyte Disk Cartridge System. Use the Disk Cartridge System as your primary data storage device instead of a hard disk drive. You get speed, reliability, expandability, security and transportability without compromise. Each cartridge holds 10 megabytes of data—and because the cartridges are removable, you can run an unlimited amount of data without adding drives. The Disk Cartridge System also gives you fast convenient backup. Includes cartridge. 240V AC.

26-1245 4999.00

10-Megabyte Cartridge. 26-1372 349.95

Tandy 2000 Expansion Options

Choose Your Display Monitor

Both the VM-1 High-Resolution Monochrome Monitor and the CM-1 High-Resolution Color Monitor tilt 5 or 10 degrees so you can find your best viewing angle, and each features an 80 x 25 display for easy viewing. The VM-1 has a 30.4cm green phosphor, non-glare screen and can display optional graphics. The 35.5cm CM-1 gives you vivid 8-color graphics with the Monochrome/Color Graphics options.

VM-1 Monochrome Monitor. Pedestal extra.
26-5111 349.00

CM-1 Color Monitor. Requires #26-5140 and #26-5141 graphics options. 26-5112 1149.00

High-Resolution Monochrome Graphics

Produce detailed business graphs, tables, charts and more on either the VM-1 Monochrome or CM-1 Color Monitor. 256,000 picture elements (640 x 400) produce amazing detail. User installable. 26-5140 799.95

Digi-Mouse Two-Button Mouse

Plugs in for easy cursor movement in programs like Microsoft Word, DR Graph, DR Draw, and others. Requires #26-5144 (below). 26-1197 169.95

Digi-Mouse/Clock Controller

Dual-purpose board includes controller for Digi-Mouse and perpetual time/date clock so that you don't have to re-input time and date into your applications programs. Battery back-up. User installable. 26-5144 299.00

8087 Math Co-Processor Option

Upgrades your Tandy 2000 with additional circuitry to perform graphics-intensive tasks. Increases speed as much as 50%. Programs must be specifically written (such as VersaCAD and C Compiler) to take advantage of this option. Installation required (not included). 26-5143 999.00

128K RAM Module

Expands your 128K Tandy 2000 to 256K of memory, but does not use a card slot. Installation required (not included). 26-5160 599.00

High-Resolution

Color Graphics Chip Kit

Create spectacular 640 x 400 color graphics on the CM-1 monitor. Displays 8 of 16 colors. Requires Monochrome Graphics Option. Does not use a card slot. User installable, however, installation by our technicians is recommended.

26-5141 349.00

Space-Saving Options

Tandy 2000 is more than just attractive, it's a milestone in ergonomic design. Choose the Floor Stand to position the CPU beside or under your desk to increase usable space. The compact Monitor Pedestal for your VM-1 monitor tilts and swivels for optimum viewing angle. The monitor and keyboard can be used up to 2.4M away from the computer. Using both the pedestal and floor stand, with the keyboard in your lap, you have the smallest possible "footprint"—just 21.6 x 31.1cm. And in the standard desktop configuration, the keyboard slides under the computer to minimize storage space.

Monitor Pedestal. 26-5115 179.95

Floor Stand. 26-5116 399.95

Memory Expansion Board

Contains 128K of memory. Our 128K RAM Upgrade expands this board to 256K. Two boards can be added. User installable. 26-5161 849.00

128K RAM Upgrade

Installs on Memory Expansion Board. User installable. 26-5162 299.95

10-Megabyte Hard Disk Kit

Requires installation (not included). 26-5125 2299.00

External Cable Kit for Hard Disk

Add a secondary hard disk drive to your Tandy 2000. 26-5126 89.00

SPECIFICATIONS. Microprocessor: Intel 80186 processor with 16-bit data path. Clock speed, 8 MHz. Object code compatible with 8086/8088. Two direct memory access channels. Three programmable timers. **Operating System:** Includes Microsoft's advanced MS-DOS 2.11 with BASIC. **Memory:** 256K RAM with parity, expandable to 768K. Includes power-up diagnostics. Sound included. **Keyboard:** 90-key sculptured, including numeric entry keypad. Special keys include HOLD, ESCAPE, BREAK, CTRL, CAPS, INSERT, DELETE, HOME, Up, Down, Right and Left arrows. Twelve programmable Special Function keys. Retractable legs, 1.8M coil cable and tactile keyclick. **Video Display:** Optional high-resolution, non-glare, non-interlaced 30.4cm monochrome (green) or 35.5cm color monitor 80 or 40 characters per line by 25 lines. User-definable character set. Reverse video, underline, blank, blink, double-wide/double-high. Smooth scrolling and split screen. Optional high-resolution monochrome and color graphics (displaying 8 colors selected from 16—white, yellow, cyan, green, magenta, red, blue, black. Full and half-intensity). **Disk Drives:** Two built-in double-sided, double-density, thin-line 13.3cm mini-floppies, with 720K per drive (formatted). 96 tracks per inch. Tandy 2000 HD has one 720K mini-floppy and one 10-megabyte hard disk drive. **Internal Expansion:** Four available user-accessible plug-in card slots. **External Connections:** Standard parallel port, RS-232C serial communications port, monochrome monitor. **Dimensions:** 21.6 x 31.1cm footprint (pedestal base) when using floor stand and pedestal, keyboard in lap. 47.6 x 54cm with monitor on CPU and keyboard under CPU. Keyboard 15.9 x 19.9cm. **Weight:** 18.6kg. **Power Requirement:** 240V AC, 50Hz.

HI-PERFORMANCE TANDY 1000 SX



NEW
FOR **87**

2299⁰⁰

Monitor and software
not included.

- Fifty-Percent Faster Than the IBM® PC
- Ready-to-Run—Includes DeskMate II Six-Function Software
- Software Compatible with the IBM PC—
Choose From the Most Popular Programs on the Market
- Two Built-In 13.3cm 360,000-Character Disk Drives
- Five PC Compatible Card Slots for Easy Expansion

Tandy 1000 SX. Our MS-DOS family of computers is growing to meet your needs. Since its introduction, the Tandy 1000 went on to become the hottest IBM PC compatible to hit the market. Now we've made it even better.

High Speed Performance

The 1000 SX is centered around the 8088 microprocessor, ensuring compatibility with industry-standard MS-DOS software. But unlike other "industry-standard" computers, you can run virtually all of your programs one and one-half times as fast with a 1000 SX. This software-switchable speed control lets you finish spreadsheets, sort data bases and display intricate charts and graphs faster than ever.

To complement this new level of sophisticated performance, the 1000 SX comes with 384K RAM, expandable to 640K on the main board, and two built-in disk drives. And with five card slots, it's easy to expand your system. Expansion boards are user-installable, and you can choose from memory expansions, internal modems — even a 20-megabyte hard disk card!

SPECIFICATIONS: Microprocessor: Intel 8088, Clock Speed: 7.16/4.77 Mhz, software selectable. **Operating System:** Includes Microsoft's MS-DOS 3.2 with GW-BASIC. (Reference Manuals extra). **Memory:** 384K RAM, expandable on main board to 640K. Includes power-up diagnostics. **Keyboard:** 90-key sculptured, including numeric-entry keypad. Special keys include HOLD, ESCape, BREAK, CTRL, CAPS, INSERT, DELETE and HOME. Twelve programmable Function keys. Retractable legs. 1.8M coil cable. **Video Display:** Optional high-resolution, non-glare 30.3cm monochrome (green) or 33cm Color Monitor 80 or 40 characters per line by 25 lines 256 characters. Reverse video, blank, blink, 16 foreground and 8 background colors. High-resolution monochrome and color graphics (640 x 200 pixels). Displays 8 of 16 colors — black, blue, green, cyan, red, magenta, brown, white, grey, light blue, light green, light red, light magenta, yellow, high-intensity white. Higher resolution video support available with optional expansion boards. **Disk Drives:** Two double-sided, double-density. 360K (formatted) thin-line 13.3cm mini-floppies. 48 tracks per inch. **Internal Expansion:** Five user-accessible IBM/PC-compatible card slots (10" maximum length). 8087 Math-Coprocessor. **External Connections:** Standard parallel port, composite video out, line level audio out, light pen port, two joysticks. RGBI Color Monitor. AC outlet. **Power:** 240VAC, 50 Hz.

Get Down to Business with DeskMate II

We've improved our popular DeskMate 6-in-1 applications software to take advantage of the Tandy 1000 SX's power, DeskMate II* for the Tandy 1000 SX features six applications on one disk. And with the special task-switching feature, you can exit DeskMate, enter an applications program, then return to DeskMate — all with just a few keystrokes. Start computing the first day with Text Processing, Spreadsheet Analysis, Electronic Filing, Calendar/Alarm, Telecommunications and Electronic Mail. Every day you'll be greeted by a menu that displays a calendar, appointment schedule and a list of files stored for every function. Plus, when you use your Tandy 1000 in a local area network, DeskMate II is ready, because it's compatible with ViaNet.

And since the Tandy 1000 SX is PC compatible, you can choose from an astounding collection of MS-DOS programs. Select from popular spreadsheet, word processing, integrated applications, business graphics, education or entertainment programs.

Packed with Deluxe Features

With the Tandy 1000 SX, most of the "options" you expect to pay more for are included. Adapters are built in for easy hookup to a monochrome or color monitor. You can even display high resolution graphics on our lowest-priced monitor. Or use your color TV with an optional RF modulator for 40 column text and color graphics. Adapters for a printer, joysticks, or light pen are all standard, as are the disk operating system and BASIC. Whatever your needs, the Tandy 1000 SX is the most powerful computer for the money. 25-1051 2299.00

*DeskMate II requires monitor. Telecommunications and E-Mail require optional modem.

ENTRY-LEVEL TANDY 1000 EX



NEW
FOR 87

1499⁰⁰

Monitor, platform, disk
drive and software extra.

- The Lowest-Priced MS-DOS Based Personal Computer
- Get PC Compatibility at a Fraction of the Price
- Fifty-Percent Faster Than the IBM® PC
- Incredibly Easy-to-Use Personal DeskMate Software
- Choose from Thousands of Popular Programs
- Built-In 360,000-Character Floppy Disk Drive
- Ideal for the Home, A Natural for Schools

Tandy 1000 EX. Now there's no reason to settle for a "game" computer. The new Tandy 1000 EX is a true PC-compatible computer, ready to use the MS-DOS software you bring home from the office, as well as software designed for the home or classroom. Inside the sleek one-piece design resides a 13.3cm disk drive and 256,000-character RAM. The integral 90-key keyboard has the same layout as the Tandy 1000 SX, ideal for business programs. You'll find an advanced three-voice sound circuit for sophisticated sound and music generation through the built-in speaker. There's also a headphone jack with volume control for quiet listening — perfect for the classroom.

The Advantages of Personal DeskMate

Every Tandy 1000 EX comes with a new graphics-oriented version of our DeskMate productivity software. Personal DeskMate* is amazingly easy to use, with handy pull-down menus and pop-up boxes for selecting functions. Add an optional Digi-Mouse® or joystick and you'll have the ultimate in convenience.

With TEXT you'll see a simple text entry and editing system that includes cut/copy/paste functions, search and replace, and underlining and boldface. WORKSHEET gives you a simple in-memory spreadsheet application with 99 rows and 99 columns of numeric, text, or calculated cells. It will support selectable column widths, as well as numeric and text cell format options. DESKTOP helps you visually organize and manage program and data files. You can install any combination of applications onto the screen, including CALCULATOR, NOTEPAD, CALENDAR and PHONE DIRECTORY. You can use FILER to keep track of your recipes. With PAINT you'll have a simple graphic picture editor that includes functions for drawing basic shapes (solid or outline), lines, points, fonts, and pattern fills. And of course we've included TELECOM, our basic telecommunications package for communicating with information services as well as for uploading and downloading files.

Ready to Use, Ready to Expand

The one-piece Tandy 1000 EX offers convenient portability — just plug in a monochrome or color monitor, or a TV set with an optional RF modulator. Plug in joysticks, printer or a second disk drive without buying extra-cost adapters. Add the Memory PLUS Expansion Adapter for two additional connectors for more memory, modem telecommunications, Digi-Mouse.

If you've been searching for a computer that's "just right" for your family or classroom, then the Tandy 1000 EX is exactly what you've been looking for.

Tandy 1000 EX. 25-1050 1499.00
Tandy 1000 EX Monitor Platform. 26-210 99.95

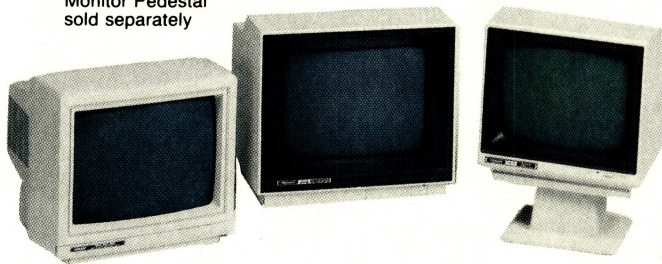
SPECIFICATIONS: Microprocessor: Intel 8088. Clock Speed: 7.16/4.77 Mhz, software selectable. Operating System: Includes Microsoft's MS-DOS 2.11 with GW-BASIC. (Reference Manuals extra.) Memory: 256K RAM, expandable to 640K. Includes power-up diagnostics. Keyboard: Integral 90-key sculptured, including numeric-entry keypad. Special keys include HOLD, ESCape, BREAK, CTRL, CAPS, INSERT, DELETE and HOME. Twelve programmable Function keys. Video Display: Optional high-resolution, non-glare 30.3cm monochrome (green) or 33cm Monitor 80 or 40 characters per line by 25 lines 256 characters. Reverse video, blank, blink, 16 foreground and 8 background colors. High-resolution monochrome and color graphics (640 x 200 pixels). Displays 8 of 16 colors — black, blue, green, cyan, red, magenta, brown, white, grey, light blue, light green, light cyan, light red, light magenta, yellow, high-intensity white. Disk Drives: One double-sided, double-density, 360K (formatted) thin-line 13.3cm mini-floppy. 48 tracks per inch. Internal Expansion: One "PLUS" style expansion board or two "PLUS" style expansion boards when used with Memory PLUS Expansion Adapter (25-1062). External Connections: 13.3cm 360K or 8.89cm 720K External Disk Drive, standard parallel port, composite video out. 1/8" headphone jack with volume control, two joysticks. RGBI Color Monitor. AC outlet. Power: 240VAC, 50 Hz.

*Personal DeskMate requires monitor. Telecom requires optional modem.

MONITORS, ADD-ONS AND BOOKS

Complete Your System with the Tandy Display Monitor That's Right for You

Monitor Pedestal
sold separately



We offer monitors for every need and budget. Our monochrome monitors have non-glare, green phosphor screens. Or pick a color monitor for brilliant graphics.

VM-1 Monochrome Monitor. 30.3cm screen displays 80 x 25 text, 640 x 400 graphics. Tilts 5 or 10 degrees for best viewing angle. 26-5111349.90

VM-2 Monochrome Monitor. 30cm green phosphor screen, non-glare, non-interlaced. 26-3211349.95

CM-1 Color Monitor. 35.3cm screen displays 80 x 25 text, 640 x 400 graphics. Tilts 5 or 10 degrees for best viewing. 26-51121149.00

NEW! CM-5 RGBI Color Monitor. 33cm screen displays 80 x 25 text, 320 x 200 graphics. 25-1023599.00

NEW! CM-10 RGBI Color Monitor. 33cm screen displays 80 x 25 text, 640 x 200 graphics. 25-1022899.00

Quick-Reference Chart for Tandy Display Monitors

	Video Adapters for Tandy 3000		Tandy 1000	CoCo	Tandy 2000	CoCo 3
	25-3045	25-3047				
VM-1		640 x 400 Text and Graphics(3)			640 x 400 Text and Graphics(4)	
VM-2	640 x 200 Text and Graphics		640 x 200 Text and Graphics			
CM-1		640 x 400 Text and Graphics(3)			640 x 400 Text and Graphics(5)	
CM-5	320 x 200 Text and Graphics		320 x 200 Text and Graphics			
CM-8 See page 25						640 x 200 80-Column Text and Graphics
CM-10	640 x 200 Text and Graphics		640 x 200 Text and Graphics			
	320 x 200 40-ColumnText					
TV	320 x 400 * 40-Column Text(2)		320 x 400 * 40-Column Text(2)	192 x 256 32-Column Text		320 x 200 32/40-Column Text and Graphics

*Requires optional RF modulator



Two-Button Digi-Mouse

169⁹⁵

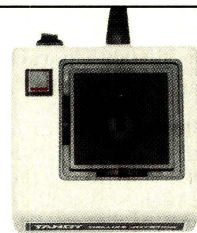
Ideal for Use with
Graphics Programs

Plugs in for easy cursor movement in graphics programs, as well as other applications. Requires Digi-Mouse/Clock Controller Board (26-5144, 25-1010 or 25-1015). 26-1197169.95

Deluxe Joystick

49⁹⁵

Get Quicker and
Easier Cursor Control



You can feel the difference. Patented stick mechanism for more accurate cursor control and quicker response. Select "spring-centering" or "free-floating" operation. 26-301249.95

Instructional and Reference Books

MS-DOS Reference Manual. Complete reference guide to MS-DOS. 25-150159.95

GW-BASIC Reference Manual. Complete reference guide to GW-BASIC commands. 25-150259.95

MS-DOS: The Basics. Explains the basics of the MS-DOS system, its functions and possibilities. 25-150617.95

MS-DOS: Advanced Applications. Discusses working with files and devices, organising your files, simplifying your work, controlling the flow of data, personalising your system, keeping your system healthy and "looking behind the scenes". 25-150724.95

Learning BASIC for Tandy 1000/2000. An excellent tutorial for BASIC programming by Dr. David Lien, author of our famous Model I Owner's Manual. 25-150034.95

The Complete Guide to the Tandy 1000. An extremely thorough examination of the power of our most popular computer. Covers basic operations, software options, compatibility issues, mastering MS-DOS, hardware, expansions and more. 25-150529.95

Tandy 1000 Programmer's Reference Manual. Documents all BIOS subroutines and entry points for use in low-level languages. 25-150317.95

Tandy 1000 Technical Reference Manual. Includes schematic diagrams and theory of operation on the Tandy 1000 and option boards. 25-150449.95

POWERFUL EXPANSION OPTIONS

20-Megabyte Hard Disk Card

NEW
FOR **87**

1799⁰⁰

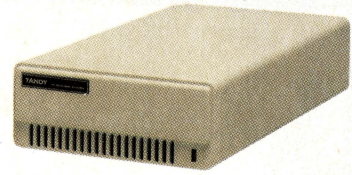
- An Efficient New Way to Get Hard-Disk Storage
- User-Installable Card Saves on Desk Space

Get 20 megabytes of hard-disk storage on a user-installable card. Mounts in a 25.4cm card slot on the Tandy 1000 or a 33cm slot on the IBM PC or PC compatible. Operates as either first or second hard disk and can run a second hard disk drive. Comes with a thorough installation manual and a diskette with special installation software. It's the easiest way yet to get hard-disk storage power! 25-1029 1799.00

External 10-Megabyte Hard Disk Drive

1699⁰⁰

Get 10 Million
Characters of
Data and Program
Storage



Expand your Tandy 1000's storage affordably. Add two to the Tandy 1000 or one to the Tandy 1000 HD for 20 megabytes of total system storage. (Cable Kit and installation required for secondary unit). Requires Hard Disk Controller Board. 25-1025 1699.00

User-Installable Tandy 3000 Expansion Boards and Options

1.2-Meg. Floppy Disk Kit. High-performance, high-capacity floppy disk drive. Store 1.2 megabytes of data. Can also read and write 360K disks. 25-4050 579.95

360K Floppy Disk Kit. 25-4051 399.95

Hard Disk Controller. Lets you add an internal 20-megabyte hard disk. 25-4060 1199.00

20-Megabyte Hard Disk Kit. Use with Tandy 3000 HD to increase internal storage by 20 megabyte. 25-4062 1699.00

External Hard Disk Cable Kit. 25-4063 199.00

NEW! Memory Expansion Board. Add up to 2 megabytes of memory to your Tandy 3000. Comes with 1 meg of memory. In MS-DOS, use VDISK to set aside portions of your computer's RAM memory that simulate disk storage. Use board for more efficient operations using XENIX System V operating system. 25-4030 799.95

NEW! 4-User Board. Adding this multiuser board to your Tandy 3000 computer enables it to support up to four serial

devices operating at 9600 baud. For use with the XENIX system V operating system. The board uses a Z80 controller for greater speed. 25-4031 599.00

80287 Math Co-Processor. Add to your Tandy 3000 to perform one set of functions while the co-processor simultaneously performs highly accurate mathematical calculations (arithmetic, trigonometric operations and logarithmic functions) at high speed. Programs must be specifically written for this option. 25-4033 859.95

Tandy 1000/3000 Serial Parallel Adapter. Add a second serial/parallel adapter to connect a second printer or increase your communications capability with an additional modem. 25-4034 399.00

10-Megabyte Disk Cartridge System Interface Kit. For Tandy 1000/3000. 25-3022 449.00

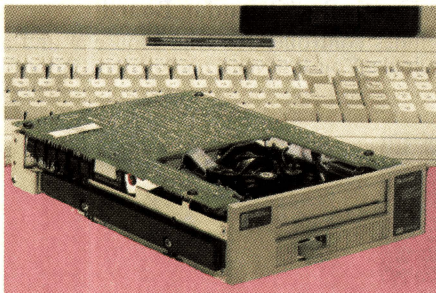
NEW! 20-Megabyte Disk Cartridge Interface Kit. For Tandy 1000/3000. 25-4081 349.95



Tape Backup by Tallgrass™

- Easy to Use
- Industry Standard Format and Media
- Powerful Error Correction
- Tape Overwrite Capability without Prior Erasure
- Single File or Multiple File Backup and Restore

TG-1020i Tape Backup System



TG-1020i*

1999⁰⁰

The TG-1020i is a 20 MB half-height 13.3cm automatic tape backup system for use with the Tandy 1000/3000.

The TG-1020i includes the most advanced software support available for tape with four different backup options, including BackTrack™, the automatic backup software program. BackTrack backs up your data automatically without user intervention. A Tallgrass exclusive feature.

The TG-1020i has a one year warranty.

Other Tallgrass products available on request.

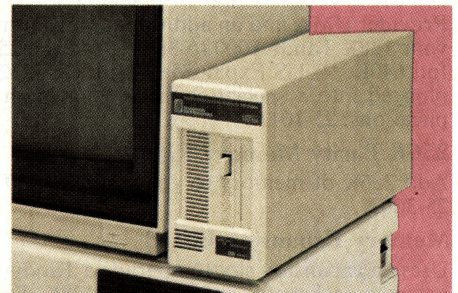
External Data Storage Systems

TG-1020e*

2599⁰⁰

TG-2025e

4499⁰⁰



Both units back up your data on a shirt-pocket size cartridge tape. These systems are designed to fit next to the monitor on top of a PC, requiring no additional desktop space. The systems are compatible with the Tandy 3000/HL/HD.

TG-1020e and TG-2025e users may select any of four different software based tape backup options, including BackTrack™, the automatic backup software program, which backs up your data when you don't. A Tallgrass exclusive feature.

The TG-1020e and TG-2025e have a one year warranty.

UPGRADE & EXPANSION OPTIONS



Add a Disk Drive to Your System

NEW
FOR **87**

549⁹⁵

8.89cm 720K External Disk Drive. Gives twice the storage of a 13.3cm disk drive and uses smaller, more durable diskettes. Special features in the Tandy 1000 EX allow you to store programs on this disk drive and load them directly. 25-1061 . 549.95

13.3cm 360K External Disk Drive. Makes backing up diskettes much easier! Also very useful for personal productivity applications. 25-1060 . 499.00

Tandy 1000 Disk Drive Kit. Provides an additional 360K of disk storage. Mounts internally. Installation recommended (not included). 25-1005 . 399.95

Tandy 1000/3000 Expansion

Digi-Mouse

Plugs in for easy cursor movement in graphics programs, as well as other applications. 26-1197 . 169.95

NEW! Memory PLUS Expansion Adapter

Expands your Tandy 1000 EX to 384K and adds DMA circuit to speed up computer operations. Sockets allow you to expand another 256K. Also provides connectors for addition of two PLUS Upgrade Boards. 25-1062 . 299.95

Memory PLUS Expansion Board

Provides DMA and an additional 256K of memory — bringing your 128K Tandy 1000 to 384K. Add the 256K RAM Kit for a full 640K. PLUS Expansion Board (RS-232 or Mouse) can be plugged into a special connector, saving a slot for other applications. 25-1011 . 519.95

256K Parity Memory Kit

Add 256K of memory to your Tandy 1000 or 3000. 25-3062 . 299.95

Memory Expansion Board

Uses an expansion slot to upgrade a Tandy 1000 to 512K. Also provides sockets for an additional 128K. For Tandy 1000/PC/Compatibles. 25-1009 . 399.95

128K RAM Upgrade Kit

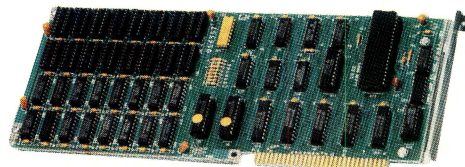
Use to upgrade your Tandy 1000 from 256K to 384K or from 512K to 640K. 26-5162 . 299.95

NEW! 8087 Math Co-Processor

For Tandy 1000 (25-1000A or 25-1001A only), 1000 SX. Increase throughput up to 10 times with software that supports a co-processor. Supported by most CAD programs and many more. 25-1012 . 499.00

Digi-Mouse Controller/Calendar Board

Dual-purpose board includes controller for Digi-Mouse™ and perpetual time/date. Never have to enter time and date again. 25-1010 . 229.95



Memory Expansion Board

User installable board expands to 256K RAM. With direct Memory Access Controller. 25-1004 . 499.95

128K Parity Memory Kit. For use with 25-1004/25-1009 to upgrade your Tandy 1000 from 256K to 384K or from 512K to 640K. 26-5162 . 299.95

NEW! Dual Display Graphics Adapter

Combines the function of 3 boards in one. Uses VM-2 and CM-10 monitors. Displays up to 640 x 200 in 16 colors with special software. Features Hercules-compatible graphics mode for use with VM-2 monitor. 25-3045 . 499.00

Deluxe Graphics Display Adapter

Allows your Tandy 3000 to display high-resolution graphics (640 x 400) on the CM-1 or VM-1. (Standard on 3000 HD.) 25-3047 . 999.00

Hard Disk Controller Board

Allows you to add hard disk drives for up to 70 million characters of storage for data and programs. Compatible with most Tandy 1000 software — most programs transfer directly to hard disk. Includes cable for use with our 10, 15 or 35-Megabyte Hard Disks. 25-1007 . 649.95

PLUS Upgrade Boards

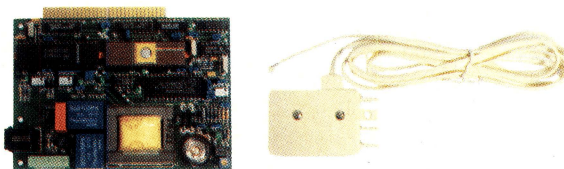
These boards are specially designed for use with the Tandy 1000 EX or our Memory PLUS Expansion Board. You can also use them with the Tandy 1000 SX or any other PC compatible with the PLUS Upgrade Adapter Board. All PLUS Upgrade Boards are user installable with just a few simple tools.

PLUS RS-232 Option Card

Lets your computer talk with other computers and access national information services, when combined with communications software and external modem. Use with high-speed modems or serial plotters and printers. 25-1014 . 229.95

PLUS Digi-Mouse Controller/Calendar Board

Dual purpose — includes controller for Digi-Mouse™ and a perpetual time/date clock. You'll never have to enter time and date again! 25-1015 . 229.95



Internal Intelligent Modem

Direct connect modem eliminates acoustic interference and data corruption. With auto-answer auto-dial and auto-disconnect. Includes VTEX 2 software for Viatel and other videotex services. 300 baud full duplex and 1200/75 baud full duplex (videotex). With Telecom approval. 25-9402 . 699.00

PLUS Upgrade Adapter Board

Allows you to use PLUS Upgrade Boards in a standard PC card slot. 25-1016 . 44.95

TANDY 3000 XENIX

The Multiuser Multiprocessing Solution

XENIX Operating System. The XENIX System V/286 Operating System for the Tandy 3000 based on Unix System V, appeals to two environments: the office that needs simultaneous access to data, and the software development environment. The business market for this system wants the power of an 80286-based microcomputer for multi-user office automation. The software developers may have learned the art of programming on mainframes using a UNIX environment and are now looking for the same development tools on a microcomputer.

A minimum system would require 1 megabyte RAM memory, a hard disk drive with at least 20 megabytes of storage, a monochrome monitor (color is not necessary) and an IBM graphics compatible printer.

Features include the ability to operate on up to five terminals or personal computers as well as several large system features. These include multi-user, multi-tasking capability with system accounting and 3-level security, print, spooling, job monitoring and electronic mail. There's also a programmable user interface to provide a flexible framework for office automation. XENIX system V provides for loadable device drivers allowing users to create device drivers for new hardware without requiring an update to XENIX. XENIX, as an industry standard operating system has a huge range of applications to choose from and represents the centrepiece of this versatile business applications package. 25-42011199.00

XENIX Text Processing System. Technical writers using this software will work faster and adapt easier to changes. There are many utilities, filters and word processing features to help computer products developers produce top quality documentation.

The minimum system would need 1 megabyte of memory, at least 20 megabytes of storage and the XENIX operating system.

The software has the ability to run entire files through pipes and copes with version changing, indexing, table formulation and much more.

Features include the ability to harness the power of XENIX to help produce professional documentation. The software also has the ability to run entire files through "pipes" between various filters and utilities. This makes it easy to perform global operations such as formatting, spelling checks, insertion of typesetting codes and much more. The program also provides utilities for the most basic word processing needs and the most complex programmed operations. Version changes, indexing and table formulation all become easier with this product. Peripherals that may be required as specific needs dictate include custom forms, white tractor feed paper and a sheet feeder. 25-4203299.00

XENIX Profile 286. This powerful database addresses the needs of beginners as well as experienced personal computer users who have a need for a full-featured database in a multiuser operating environment. Small businesses, school systems, medium sized businesses and even large corporations will find the versatility and power of Profile 286 fits a wide variety of application needs. Profile 286 is one of the few database management systems that can increase functionality readily as the user's sophistication increases.

The minimum required system would need to have 512K of memory, one floppy disk drive with at least 1.2 megabytes or one hard disk drive with at least 20 megabytes, a monochrome monitor and text adapter and XENIX Operating system.

Features include multi-user capabilities through the use of the XENIX Operating System. This allows more than one user to access information from the same database at the same time. Profile 286 also offers an advanced programming language which allows users to custom design specific applications such as inventory control and general ledger. Files can be linked together via a "LOOKUP" command. Menus can be custom designed to execute any application from XENIX. Data can be used to produce merge letters with Scripsit 286. A complete sam-

ple session is included along with sample data to help in the learning process. And the accompanying instruction manual is written in plain English to make understanding simple. 25-42121399.00

XENIX Development System. The XENIX System V Development system is for serious software developers using the C programming language. It is based on UNIX System V, the standard for multi-user software development. The XENIX system will appeal to programmers that have worked on mainframes using UNIX since they will find the same programming tools on a microcomputer. C programs are transportable to almost any hardware. The fact that programs can be used with hardware that will be purchased in the future extends the useful life of software and helps justify development expenses.

The minimum system must have at least one megabyte of memory and a hard disk drive with at least 20 megabytes of storage as well as an IBM compatible printer.

Features include the ability to support up to six programmers as well as an extensive library of subroutines to minimise the amount of actual coding needed to produce programs. Utilities such as keyboard verification, source code control and subroutine relationship tracking help organise and structure programs while reducing the chance for errors. The system also offers user installable device drivers and provides all the tools necessary to create device drivers. And Tandy's years of experience in supporting and enhancing XENIX means that the necessary support information is just a phone call away. Comes complete with a carefully written manual that makes usage simple. 25-4202999.00



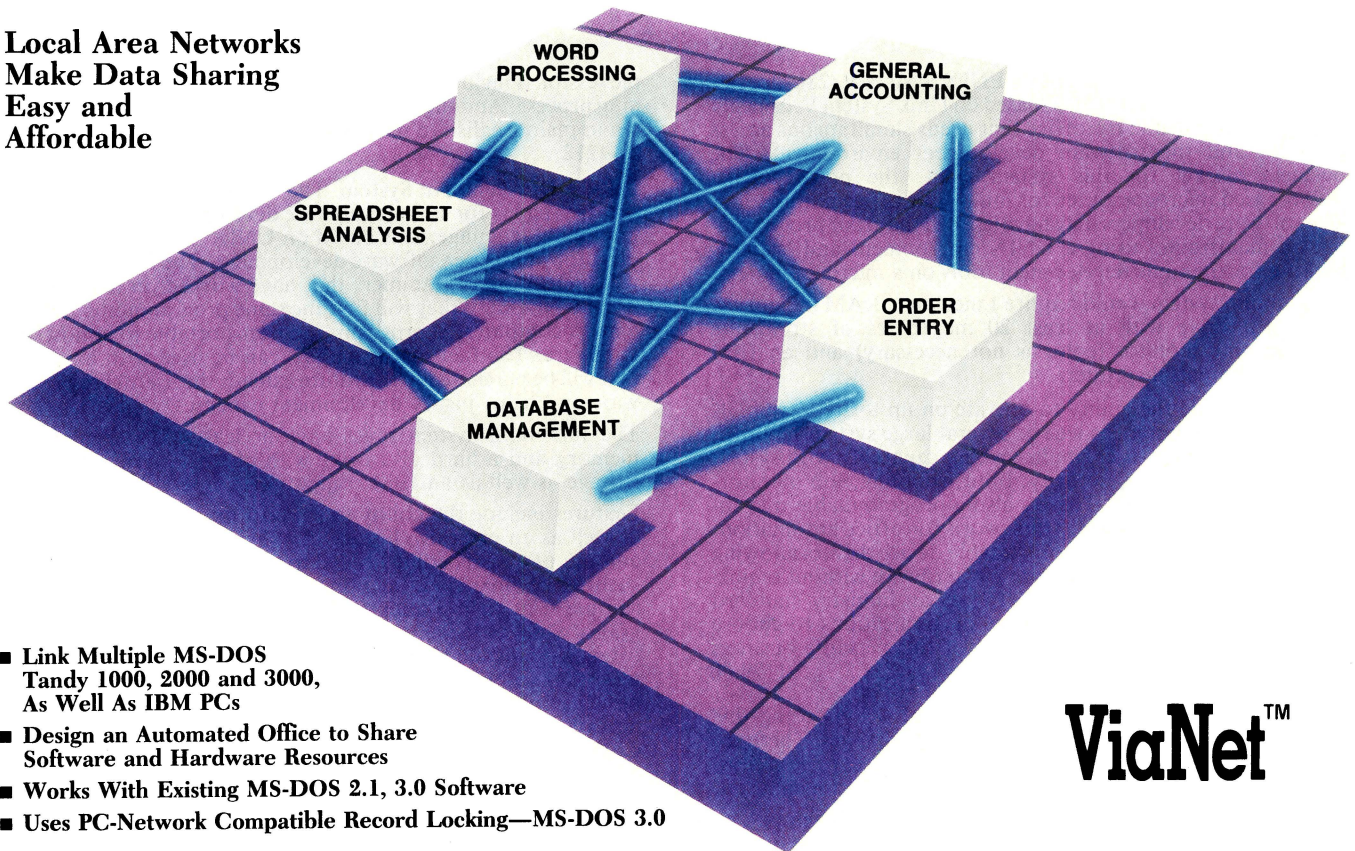
Scripsit 286. The multi-user XENIX word processor is appropriate for any office environment where several users routinely work on the same documents or where sharing a high quality printer or two is desirable. Secretaries, professionals, small businesses, legal representatives, various areas of the medical profession and many more will find that the versatility, ease of use and power of operation will handle current word processing needs as well as being very well prepared for the future.

The minimum system required needs at least 640K of memory, one floppy disk drive with at least 1.2 megabytes and a hard drive. XENIX system V/286 is also a requirement.

Function key labels appear at the bottom of the screen when using the DT-100 Data Terminal. These labels help make Scripsit 286 one of the easiest word processors to learn. It also includes a built-in dictionary from Houghton Mifflin which finds misspelled words as well as providing an alternative suggestion for the correct spelling. Print queuing and background printing allows all users to share a single letter quality printer. Scripsit 286 can also be used by several programmers at the same time and is capable of proportional spacing where the number of characters printed on a line is determined by the individual sizes of each character. With extensive editing functions, formatting and special text options such as line centering and choice of font and print types. With clear instruction manual. 25-4213799.00

NETWORK OFFICE AUTOMATION

**Local Area Networks
Make Data Sharing
Easy and
Affordable**



- Link Multiple MS-DOS Tandy 1000, 2000 and 3000, As Well As IBM PCs
- Design an Automated Office to Share Software and Hardware Resources
- Works With Existing MS-DOS 2.1, 3.0 Software
- Uses PC-Network Compatible Record Locking—MS-DOS 3.0

ViaNet™

Why You Need a Local Area Network

Maximum efficiency in today's office is achieved through automation of word processing, filing and other business applications. An ideal solution is to connect your computers together to form a local area network. While the sharing of software and hardware resources offers savings in time and office space, networking has been prohibitive for many businesses. Most micro nets require expensive dedicated file servers. In addition, it is difficult to "mix and match" different computer equipment, because all computers within a network had to be operating system compatible. But now there's ViaNet — a software system that links Tandy's MS-DOS computers into a local area network. Best of all, it is no longer necessary to invest in an expensive dedicated computer file server.

Versatile ViaNet™ Network

ViaNet makes all resources on the network available to each user. With ViaNet, users may easily and quickly share programs, data and such costly resources as letter-quality printers,

hard disks or backup devices. The software is resident at each station, so the network operates as a global supervisor, without requiring a "master" station. Most important, ViaNet is as easy to use as a stand-alone computer. Operating system commands work precisely the same under ViaNet as in a stand-alone environment. Each computer in the system requires an Arcnet Datalink Board, and is connected to a "hub" with coaxial cable. Boards include software and user's guide. Installation recommended (not included). ViaNet requires 128K more RAM than is required for applications and MS-DOS.

Network Hardware

Tandy 2000 ViaNet System. 26-1220 999.00

Tandy 1000/3000 ViaNet System.

26-1221 999.00

ViaNet Administrator's Guide.

26-1222 18.95

Active Hub. Lets you connect eight computers up to 600 metres apart. Active Hubs can be linked. Adding Passive Hubs to an Active Hub allows service of up to 24 CPUs.

26-6508 1999.00

Passive Hub. Connects four computers to each other up to 60 metres apart. Two passive hubs cannot be connected in series.

26-6504 179.95

RG-62 Bulk. 26-6513 Per metre/1.99

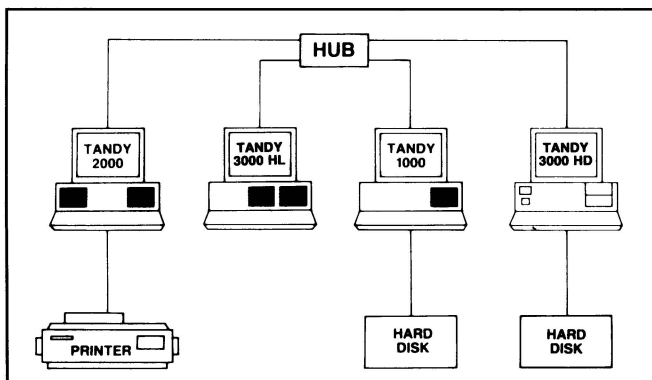
BNC Fitting. 278-104 5.95

BNC/BNC Coupler. 278-115 4.59

Type 1094 Female BNC. 278-105 3.49

Female BNC. 278-9802 5.95

Coax Cable Stripper. 278-240 21.95



DELUXE DATA DISPLAY TERMINAL



1549⁰⁰

- 35.5cm High-Resolution Screen
- 80 or 132 Columns by 26 Lines
- Sculptured Keyboard

DT-100. Fully compatible with most DEC and UNIX-based software systems. Features green display screen, a high-resolution character set (128 ASCII), 16 programmable keys, cursor control keys and numeric pad. Terminal configuration is set from the keyboard. 26-6052 1549.00

DT-100 SPECIFICATIONS. Data Transfer Rate: Up to 38,400 bps. Video Size/Format: 24 lines (plus 2 status lines) of 80 or 132 characters. Upper and lower case. Video Attributes: Normal, underline, reverse and dim. Input/Output: One RS-232C communications port and one RS-232 printer port. Power: 240V, 50Hz

10-Megabyte Disk Cartridge System

Removable disk cartridge makes it easy to backup and store data. Get the flexibility of floppy disk storage combined with the high storage capacity and rapid access time of hard disks. Includes one 10-megabyte disk cartridge. 26-1245 4999.00
Interface Kit for Tandy 6000/16. 26-6018 249.95

Hard Disk Systems

- 35-Megabyte Primary Drive.** Requires cable kit and installation (not included). 26-4171 5499.00
35-Megabyte Secondary Drive. Requires installation (not included). 26-4172 4999.00
Model 12/16B Internal Hard Disk Kit. 26-4154 4199.00*

Other Expansion Options

- 256K Parity Memory Kit.** For Tandy 1000/3000/6000. Tandy 6000 requires two kits to upgrade. 25-3062 299.95
Model 12 to Tandy 6000 Upgrade. Includes 68000 processor board and 512K RAM board. 26-6014 2499.00
RS-232 Card. Allows six people (instead of three) to use the power of the Tandy 6000/16B. Requires a minimum of 512K memory (768 recommended) and RS-232 cables. 26-6013 599.00**
Model 12 Card Cage. Provides six plug-in slots for optional expansion boards. Requires installation, not included. 26-6017 499.00
High-Resolution Graphics Upgrade. For Model 12/II. Create sophisticated on-screen charts, graphs, geometric patterns, even animation. 153,600 pixels (640 x 240). 26-4104 799.00**

Increase the Versatility of Your Model 4/III/I Computer

Model 4 Cable Kit. Includes TRSDOS 6.2. For use with 26-4155, 26-1134 129.95

Model 4 64K RAM Kit. Expands 64K Model 4 to 128K. Required for Model 4 cassette-to-disk upgrade. Extra memory not accessible by BASIC. 26-1122 169.95*

Model 4 Upgrade Kit. Converts Model III disk computer to a Model 4 disk system (except for cabinet). Includes new keyboard, 64K RAM, TRSDOS 6 diskette with Disk BASIC. 26-1123 1299.00*

Model III/4 RS-232C Serial Communications Board and Cable. Requires modem and software. Installation required (not included). 26-1148 189.95

TANDY 1000/2000/3000*ACCOUNTING SOFTWARE

Integrity Business Software

Ascent Series. Software developed and written in Australia — it runs on Tandy 1000 or Tandy 2000.

Accounts Receivable — Ascent Series**

Ascent's Accounts Receivable controls customer accounting for up to 999 customers. There is facility to charge interest on outstanding payments and debit periodical payments. Produces statements and labels, as well as a bank deposit sheet and the trial balance with a mini word processing facility.

Accounts Receivable integrates to Ascent's Inventory/Stock Control, General Ledger, Cashbook and to dBaseII, WordStar and Lotus 1-2-3. per core615.00

Inventory/Stock Control — Ascent Series

Ascent's Inventory/Stock Control handles up to 32000 stock items. It automatically updates stock levels and debtors accounts while producing on-line invoices. Includes Back Order system. The profitability and value of each product line may be calculated. MTD, YTD and past year figures may be analysed according to salesman and area. Status is available on sales, invoices, receipts, stock levels, prices and back orders.

Inventory/Stock Control integrates to Ascent's Accounts Receivable, Accounts Payable and to dBaseII and Lotus 1-2-3. per core615.00

General Ledger — Ascent Series

Ascent's General Ledger handles up to 999 accounts. Each account may be broken into 999 departments. Before posting to the Ledger, data goes to a batch file for checking and updating. Entries may be posted up to 12 months in advance. Figures for the month and for the last year are kept on file for comparison. The system produces a Balance Sheet, Trial Balance and Profit and Loss reports.

General Ledger integrates to Ascent's Accounts Receivable, Accounts Payable, Cashbook and to dBaseII, Lotus 1-2-3 and Multiplan. per core615.00

Cashbook — Ascent Series

Ascent's Cashbook handles up to 999 categories each of income and expenditure. Each category can be further dissected for greater analysis. Cashbook keeps day to day control of your cashflow and produces a bank deposit sheet. All incoming and outgoing invoices, credits, cash and cheques are recorded.

Cashbook integrates to Ascent's Accounts Receivable, Accounts Payable, General Ledger and to dBaseII and Lotus 1-2-3. per core615.00

Accounts Payable — Ascent Series

Ascent's Accounts Payable details purchases, amounts owing and payment dates for discounts. On-line invoicing, cheque printing and a graphic facility are major features. An enquiry facility analyses purchases of invoices and payments.

Accounts Payable integrates to Ascent's General Ledger, Inventory/Stock Control, Cashbook and to dBaseII, WordStar and Spreadsheet. per core615.00

Payroll — Ascent Series

Payroll is an easy to use program that greatly reduces costs and administration time necessary when preparing the payroll and its associated ledgers. It allows for 20 deductions and allowances, 10 overtime rates, and 20 costs centres (such as

sales and administration) within the company. The system prepares group certificates. Payroll stores a standard timesheet for each employee. Data is only input if an employee's pay varies from this standard sheet. Payments are made by cheque, cash or bank draft. Fully optioned840.00

Professional Time Costing — Ascent Series

Professional Time Costing keeps individual and group records of labour costs for service industries. Provision is made for mark up or down for work-in-progress. Fully itemised invoices are available at any time.

per core615.00

Professional Time Costing integrates to Ascent's Accounts Receivable, Accounts Payable and to dBaseII, Lotus 1-2-3 and WordStar. per core615.00

Accounting One

Accounting One runs on Tandy 1000 or Tandy 2000. Designed for small business organisations. Easy to use, computer size and memory depends on the number of accounts and transactions.

On entering sales information, Accounting One records the order, creates the invoice, debits the customer and adjusts the stock levels — all automatically. On payment, Accounting One records payment details and credits the customer's account. Accounting One will also age outstanding debits, and record the date and amount paid to a supplier. It then automatically adjusts the company's and supplier's balances.

Invoices, credit notes, statements, suppliers listings, address labels, stock listing, bank deposit listing and activity listing can be produced. At period end, trial balance, profit and loss balance sheet can be generated.835.00

Payroll One

Payroll One has been designed to suit most small and medium sized businesses.

Key Benefits

- prepares detailed payslips on demand
- caters for weekly, fortnightly or monthly pay periods.
- there's nothing to input unless employee details change
- automatically calculates the total group tax
- automatically calculates the tax payable by each employee.
- easy-to-follow, illustrated, step-by-step format.

Group Certificates . . . each employee's total income and tax, allowances and deductions are recorded progressively during the financial year. Group certificates are easily produced on demand.595.00



SYBIZ PLUS is designed to handle completely the accounts of the average business. All modules are fully integrated, but can be purchased economically on a module by module basis.

General Ledger. In any company the key to growth and profitability is the general ledger. SYBIZ PLUS brings together all financial aspects of your operations to their focal point . . . automatically. You are therefore able to obtain a complete and up-to-date picture of your business at any time.885.00

Debtors Ledger/Sales. Computerising your debtors ledger using SYBIZ PLUS can reduce clerical labour and improve cash flow in a matter of weeks. Once customer's details have been entered, invoices, receipts and adjustments can be posted as they occur.885.00

Order Entry/Invoicing. Offers full control of customer order and back orders together with automatic invoice pricing, extension and printing.380.00

*For Multi-User System, Consult Tandy Computer Centres

NOTE: Options or fully optioned modules are available on the ASCENT Series.**

TANDY 1000/2000/3000*ACCOUNTING SOFTWARE

Creditors Ledger/Purchasing. The modules permit accurate control of purchasing and cash outflow. They enable you to hold your funds for as long as possible, yet, at the same time, maintain your credit ratings by means of timely payments.

885.00

Purchase Orders. Watertight control of purchasing can be obtained with SYBIZ PLUS. Purchase orders can be printed, amended and cancelled. Full reconciliation with deliveries and invoices is then provided.380.00

Inventory. Using SYBIZ PLUS to computerise your stock control can save you money and improve service to customers. At all times you know exactly what is in stock and what it costs. Turnover trends are analysed to minimise stock on hand. Prices can be quickly and accurately maintained. This module is widely used by manufacturers, importers, wholesalers and retailers.885.00

Job Costing. SYBIZ PLUS handles the costing of jobs from garage service work to house building. Works order numbers can be raised, costed and invoiced at the rate of hundreds a day. Major projects can split into cost centres for long term costing and the control of progress claims. The job cost module constantly monitors profitability.885.00

Sypay

Sypay is an all purpose payroll system designed to maintain employee payroll files, calculate wages, deductions and tax, and print employee pay envelopes. These functions can be performed on a weekly, fortnightly or monthly basis.

- Weekly, fortnightly and monthly payrolls are supported.
- Provision for leave loading.
- Six user maintainable tax scales.
- 90 individual earnings and 18 individual deductions are allowed.
- Provisions for annual leave, sick pay and time of accruals.
- Coinage analysis, cheque lists, and the printing of cheques.
- Two types of pay envelopes are catered for.
- The SYBIZ Advanced User Module creates ASCII file enabling the incorporation of employee details and/or pay transactions information into spreadsheets or databases.
- Balances cannot be edited without a security over-ride.
- Some of the standard reports available are: Monthly Histories; Balance lists for the period; Complete Employee Records; Printing of Group Certificates (1 or 2 across) .885.00

Book Worker

Book Worker is a completely integrated accounting system for small businesses. It is designed for simplicity and ease of use — users do not have to remember complicated codes and account numbers.

The accounting functions that can be performed are:

General Ledger (Ledger Book)
Trade Creditors (Purchases Book)
Invoices Printing (Sales Book)
Automatic adding (All books)
Trade Debtors (Sales Book)
Inventory Control (Inventory Book)

- Ease of use and transition from manual system.
- Simplifies accounting with 'help' screens and integration.
- Optional account numbering up to ten characters.
- Fully automatic price and tax calculations with over-ride.
- All transactions update the relevant Customer, Supplier, Purchase, Inventory, General Ledger Books without operator input.
- Debtors Statements and Invoices automatically printed on two part stationery (Customer and Office copies).
- Two tier Password protection for confidential data storage.
- Transaction Histories for each account in any Book.
- Instant and frequent Trial Balance.
- Optional in-built Chart of Accounts for General Ledger.
- Sales analysis.

- Trading, Profit and Loss Statements for in-built Chart of Accounts.
- Balance Sheet Statement for in-built Chart of Accounts.
- Three Price Scales — Wholesale, Trade and Retail.
- Automatic Blanket Price updates.
- Full discount and special price facilities available.
- Protection against power failures with automatic rebuilds.
- On screen viewing of accounts balances and transaction histories. T1000/3000.995.00



System 4

System 4 is an integrated accounting system which includes the four (4) most sought after modules:

1. Accounts Receivable
2. Accounts Payable
3. General Ledger
4. Invoicing

The system also has a novice function for first time users. If this function is activated the system continually prompts the user with reminder messages.

A comprehensive file recovery program has been built in to help you recover from power failures and corruption of data files. All System 4 files are in ASCII code and are therefore available for manipulation by Lotus 1-2-3 and dBase II and III. Tandy 1000/3000.645.00



C.P.A. + is a fully integrated accounting package that works in full complement with Lotus 1-2-3. In order to use it, you do not need to learn to use Lotus 1-2-3.

- All the capability of Lotus 1-2-3 for editing, saving, and printing data.
- Ability to scroll through entries, view them before printing, and change records or fields without starting over.
- Instant graphs of summary information from the journals of original entry.
- Forecasts available include cash disbursements and receipts, purchases, and sales.

GENERAL LEDGER:

- Use as many as 35 characters to describe each account.
- Up to 700 accounts available depending on computer memory. Financial and Income Statement features are what most businesses want.

ACCOUNTS PAYABLE:

At least 12 information category for each payable. Cash disbursements allow viewing payables by invoice or due dates.

ACCOUNTS RECEIVABLE:

- Automatic updating of the General Ledger.
- Up to 700 companies.
- Automatic or selective cash receipts.
- Aged reports and graphs as of any date.
- Ability to print one statement at a time.

EMPLOYEE PAYROLL:

- Automatically updates the General Ledger.
- Automatically updates the Quarter-to-Date and Year-to-Date files. Calculates taxes.
- Employee numbers are not required.
- Up to 48 employees, depending on computer memory: Tandy 1000/3000.645.00

COMMITMENT TO AGRICULTURE



When Tandy introduced the world's first mass produced microcomputer (the TRS-80 Model 1) to Australia, some of its first purchasers and users were Australian farmers.

These pioneers of a new age were so excited about the ability of these new

machines to help them in farm management that they requested Tandy to do more to bring this technology to their farming colleagues.

Tandy responded in 1983 by creating an Agricultural Computer Division which continues today to assist many current and prospective Tandy farm customers with their computer needs. This part of Tandy's computer business has grown faster than any other and Tandy is still the only major computer company to provide this type of specialist service.

How are Tandy Computers Helping on The Farm?

Many hundreds of Australian farmers are now using Tandy Farm Computer Systems to improve the efficiency and profitability of their enterprises.

Stud Breeders especially have found their Tandy computers invaluable to store and rapidly retrieve a wealth of information on each animal as well as to perform calculations to rank or select animals according to averages, total scores, or other individual criteria for breeding, culling, sale, showing, treatment, etc.

Tandy's Hard Disk systems enable larger Stud Breeders to store not only the pedigrees of their current breeding stock but also previous generations, artificial insemination stock, and other breeders' stock where they have been used. These pedigrees can be instantly produced on either a high resolution Tandy monitor or one of the high quality Tandy Dot Matrix or Daisywheel Printers.

Dairy, poultry and pig producers have also found their Tandy computer systems great value for calculating feed rations and for recording ongoing production details so as to maintain the highest possible economic production level, thereby maximising profits.

Extensive graziers have found it a lot easier using their Tandy computers for recording their overall livestock numbers as well as their production figures for either individual animals or the whole herd or mob. They can also enjoy the considerable economic advantages of buying and selling their livestock on their Tandy computers through the C.A.L.M. service.

Crop growers and orchardists have found Tandy computers ideal for maintaining historical records on their individual paddocks or blocks and for calculating the returns so that they can plan which fertilizers, herbicides, insecticides and cultivation methods will give them the optimum return for each year.

Additionally irrigators and cane farmers have found running landforming programs on their Tandy farm computer to be the most economical approach to laser levelling of their properties.

Tandy has also solved the isolation problem for many Australian farmers. Using a Tandy modem and communications program these farmers have hooked up their Tandy computer to the telephone line and tapped into information services such as Elderlink, AgriData and Viatel.

Having instant access to constantly updated business, general and technical farm information 24 hours a day has helped them make more informed decisions and put more dollars in their pockets. Ask your local Tandy store or dealer for a demonstration of these services.

Why Choose Tandy?

There are many reasons why Australian farmers choose Tandy for their Farm Computer Systems.

Tandy offers the most complete range of computer products (terminals, printers, modems, software, accessories) of any company so you can get everything you need at the one location.

Tandy design and manufacture their own computers with features and quality control standards higher than any computer company and Tandy computers have proved their reliability all over Australia.

Tandy has Service Centres located in each capital city, staffed by highly trained technicians, and equipped both with the latest testing equipment and an extensive supply of spare parts.

Tandy's documentation on both their hardware products and software programs is second to none and easily understood by the new user.

Tandy is the only computer company which can offer you expert assistance in the form of a Software Sourcefile which is held in each store. It contains details of hundreds of programs suitable for Australian Agriculture and Horticulture, all of which will run on Tandy computers.

Tandy is the only computer company with a National Agricultural & Horticultural Co-ordinator whom you can contact for expert advice by either writing to P.O. Box 254, Mt. Druitt, NSW 2770 or telephoning on (02) 675 1222.

In summary, Tandy is committed to and able to provide the highest level of service, the best quality products, and total support of these products to their farm customers.

No other computer company offers this level of commitment and service throughout Australia and this is certainly the reason why Australian farmers have made Tandy their **NUMBER 1 CHOICE IN FARM COMPUTER SYSTEMS!**

KYFARM Accounting Software



Tandy's KYFARM Finance Manager program replaces the farm Cashbook. It's ability to not only neatly and accurately record the farm financial information but also to perform a variety of detailed analysis of that information in seconds makes it a must for all serious farm managers.

KYFARM Finance Manager makes farm budgeting easy and cashflow reports comparing the budget with actual income and expenditure can be produced at the touch of a button.

The program has the ability for you to use the same account codes as the farm Accountant and performs all the relevant calculations with complete accuracy, thereby greatly facilitating the preparation of the annual tax return.

KYFARM Finance Manager is also ideal for management as it has the ability to cost individual enterprises through gross margin analysis (on more than one property or business if necessary) and even to cost individual farm implements or areas if desired.

The program's bank reconciliation facility picks up any errors in either yours or the bank's records and enables you to find out what your true cash position is.

KYFARM Finance Manager is very easy to use, it doesn't require double entry or in-depth knowledge of accounting, and is suitable for all types and sizes of farming operations.

Model III. 26-9660 799.95
Model 4/4P. 26-9661 799.95
Tandy 1000/2000/3000. 26-9662 799.95

MODEL 4/III/II/12/16 SOFTWARE



Tandy Model 4/III

Scriptit. 4 An easy-to-use, low cost word processing program for Model 4. Prepare correction-free memos, letters, reports and manuscripts. Displays a full screen of text in an 80-character by 24-line format. Includes all the standard features that have made SCRIPSIT an outstanding word processing program for years. There's a "global search" mode to find phrases or sentences that you want to alter or delete, plus reformatting, hyphenation, centering, headers, footers, justification, margin and tab settings, automatic page numbering and more. With training manual. Requires printer, cable. 26-159669.95

Microsoft®

Multiplan. 4 An incredibly easy-to-use decision-making tool. Ideal for profit and loss projections, budgeting and sales forecasts. This popular "second-generation" spreadsheet lets you consolidate related worksheets so that information is transferred between them automatically. You can assign plain-English names to any column, cell or area, vary individual column widths, centre numbers and text within a column or align decimals. Sorting can be performed in alphabetical or numerical order. Cells can be set up individually, by row, column, block — or globally. Displays up to eight windows on the screen. Includes on-line help and a tutorial manual. Multiplan can directly utilise your current VisiCalc files. 26-153099.95

pfs:

pfs:file. 4 An easy-to-use computerised filing system that lets you record, retrieve, update and print information in a fraction of the time it takes with a manual filing system. File gives you complete control over your information, because you organise it in "forms" that you design on the screen. Enter data by simply filing in the blanks on your form. Forms can be as long or short, complex or simple, as you need. And you can change your mind about the design, even after information has been entered. Finding exactly the information you need is just as easy. You can automatically select, sort and print the information you need for mailing labels, invoices and more. 26-151869.95

pfs:report. 4 Helps you get the most from the information you have stored in pfs:file. Report summarises File data into concise, meaningful tables that would take hours to produce manually. Simply tell Report what information you want to tally from your File forms and Report does the rest. It can automatically sort and sub-total your information alphabetically or numerically, with totals, averages and counts. It can also format your report with centered titles, correct decimal point alignment, column width adjustments, column headings and page numbers. Performs complex calculations based on formulas you create so you get the figures you need fast. 26-151769.95

Target PlannerCalc. 4 Create your own financial models by entering and processing data by column, row or individual location. Features a variety of mathematical operations, including conditional commands. Prompts are in plain English and a handy "Help" screen is available at the touch of a key. 26-151249.95

The Home Accountant. III A comprehensive personal finance system for you and your family. Lets you define up to 99 budget categories, monitor transactions, keep track of up to five chequebooks and print cheques. Produces eight financial reports and bar graphs for any budget category with optional printer. Shows a historical trend analysis for any budget category. 26-151179.95

Profile III Plus. III Store almost any type of information, then retrieve it at the touch of a key. User-designed file layout, input screens and reports. Supports multiple screen designs for different views of the data. Stores up to 700 records of 255 characters in length on a 2-disk system. Allows up to 99 fields per record. Sort and search by user-supplied criteria. Math functions between fields are supported. Comes with easy-to-understand tutorial manual. 26-1592169.95

Tandy Model 12/II

Scriptit 2.0 Wordprocessing. A powerful, full-featured word processor. Easy-to-understand prompts and menus. An on-screen status line shows cursor position, margins, tabs, line spacing and page number. Multiple formats and reverse indentation can be used for outlining. Offers many advanced print features, such as super and subscripts, underlining, headers and footers, and multi-column printing. Other features include ASCII convert, programmable user keys, background printing and embedded print codes. 26-4531579.95

Profile Plus. An expanded version of Profile II. Built-in math functions do extensions, calculate taxes and totals between numeric fields automatically. "Associated" fields can be searched for similar data. An indexing system automatically organises files in logical order for high-speed access. Selectable record lengths. 26-4515549.95

Model 16B

XENIX Development System

This program includes the powerful C language and many standard UNIX utilities for developing multi-user software. Because of C's flexibility, it can be used to develop applications software for business uses, including numerical, text processing, and database programs. With assembler, text editor, spelling dictionary, electronic mail, sort utility, and compiler generators.*

XENIX COBOL Development System

A high level implementation of the ANSI-74 COBOL standard for minicomputers, the RM/COBOL compiler is ideal for developing business applications. Since its introduction in 1976, RM/COBOL has been a product professionals depend on. The power and reliability of RM/COBOL applications is enhanced by more than 1500 third party applications. RM/COBOL features include: full level 2 sequential, relative, and index file access methods, interactive screen handling capabilities, and interactive debugging.*

XENIX BASIC Interpreter

Popular Microsoft MBASIC for Model 16B. It allows you to chain together programs and pass common variables. XENIX MBASIC supports 40 significant characters per variable name, with logical record lengths of up to 32K, and record locking for multi-user program support.*

XENIX PASCAL-2

A transportable multi-pass compiler that adheres to the Pascal ISO standard while performing optimizations to generate compact, fast code. Requires the XENIX Development System.*

POPULAR TANDY 2000 SOFTWARE

Word Processing

MultiMate. Actually duplicates the features of dedicated word processors. It's packed with over 1000 features and functions, most of which can be accessed with just one or two keystrokes. You can edit one document while printing others and create form letters and mailing lists. You can even create documents from the ASCII files of another program. Includes a spelling verifier/corrector from Houghton-Mufflin containing over 77,000 words. Performs addition and subtraction on numerical data contained within your text. Includes superb manual with training lessons to get you started in a hurry. 26-5330 449.95

pfs:write. Easily create reports, letters and memos with advanced editing features and page headings and footers, centered text, right or left justification and more. The monitor displays boldface and underlined text. Best of all, pfs:write can use information stored in pfs:file to personalise form letters and even address the envelopes. Documents can be illustrated with charts created by pfs:graph or tables from pfs:report. 26-5309 209.95

Microsoft® Word. A high-performance word processing program with the capabilities to quickly handle complex writing tasks. You don't have to print the document to see how it will look. WORD shows you right on the screen. Tandy 2000 requires graphics board. 26-5314 549.95

Database Management

pfs:file. A very simple way to create and organise your own business or personal filing system. You decide how your records are to appear by simply organising information in "forms" that you design right on the display screen. Store, retrieve and review information in a fraction of the time it would take with a conventional filing system. 26-5305 209.95

pfs:report. A powerful analysis tool that creates presentation-quality tabular reports from sales, inventory and other data stored in pfs:file. Sort from any data category and calculate averages, totals, subtotals and more. Prints in alphabetical or numerical order with automatic centering and justification. 26-5306 209.95

dBase II™. A relational data base management system that's as powerful as any on the market. Yet "plain English" commands make it easy for both beginning and advanced users. You can quickly create a full business information system that will grow as you grow. Simple commands allow you to set up a screen format and enter data simply by filling in the blanks. And you can easily add, delete, edit, display and print your information. Create customised reports that access data in several data bases. And when you change the file format, the data isn't affected. Requires 256K. 26-5352 399.95

Integrated Software

Symphony. Combines word processing, spreadsheet, communications, data base management, graphics and more. Symphony lets you call up information from your files, a subscription data base service, other personal computers or a mainframe, directly onto your worksheet. Then use the data to perform "what if...?" calculations. You may then draw a graph of the results. On-screen "Help" and tutorial guide. Requires 512K and graphics. 26-5304 499.95

DeskMate. Six popular applications all on one disk. Lets you put your computer to use from day one with word processing, spreadsheet analysis, electronic filing, telecommunications and electronic mail. Using DeskMate is the easiest way to become familiar with different computer applications, so when you buy more powerful programs, you'll know what features you need. DeskMate is user-friendly, using the same commands throughout all applications. Use TEXT for preparing correction-free reports, memos and correspondence.

WORKSHEET is an electronic spreadsheet which lets you make countless "What if...?" calculations. **FILER** is a convenient electronic filing program. **TELECOM** lets you communicate with other computers and information services. **CALENDAR/ALARM** reminds you of appointments and **MAIL** lets you send and receive messages to and from other DeskMate users over the phone. 26-5316 99.95

Spreadsheet/Management Tool

SuperCalc 3. Combines an advanced electronic spreadsheet with high-resolution integrated graphics and data management. Create line, bar and stacked bar graphs, pie and exploded pie charts, and even H-Y Hi-Lo and area graphs using single-keystroke commands. Spreadsheet gives you 63 columns and 254 rows, along with calendar and date calculation, and multiple storing options. Command sequences called "macros" simplify often-used operations. SuperCalc 3's powerful data base management module is based on the spreadsheet model. Requires graphics. 26-5302 349.95

Microsoft-Multiplan™. This popular "second-generation" spreadsheet lets you link different worksheets so information is transferred between them automatically. Create multiple windows for easy data comparison. And sort data either numerically or alphabetically. On-line reference guide and plain English prompts make it exceptionally easy to use. Flexible formatting options let you print elegant finished reports. 26-5311 449.95

Lotus 1-2-3. Efficient business program for quick data manipulation. Use information on its 2048 x 256 spreadsheet to create a full range of hi-res graphics; perform "what-if" graphing. Features cell/page formatting options and Macro Command Language for storing customised applications. Requires color monitor, hi-res and color graphics. 26-5300 1599.00

Other Popular Programs

MS-GW BASIC Compiler. Compiles your interpretive BASIC programs into machine-language code, making them run faster. 26-5251 549.95

MS-FORTRAN. A subset of FORTRAN-77 with extensions and features of the ANSI standard. Link FORTRAN subroutines with MS-Pascal. 26-5255 249.95

MS-Assembler. Full-featured macro assembler for advanced programming. Assembles symbolic instructions into machine code. 26-5252 179.95

COBOL. An MS-DOS version of the popular RM™-COBOL. 26-5257 949.95

MS-Pascal Compiler. Compatible with the ISO proposed standard, with many extensions. 26-5256 549.95

DR Draw. This interactive picture editor produces presentation-quality charts, diagrams and drawings. DigiMouse an option. 26-5279 499.95

Graphwriter. Create sophisticated presentation-quality graphs. Set includes 23 different chart types. 26-5276... 799.95

The Home Accountant Plus. The best-selling home finance package in the country. 26-5340..... 229.95

The Witness. You must solve the crime in this hard-boiled Thirties "whodunit" game. 26-5376 109.95

Planetfall. A sci-fi adventure game. 26-5377 109.95

Microsoft® Flight Simulator. With 35 important aircraft characteristics and includes an out-the-window 3-D dynamic flight display and extensive flight controls. 26-5379 ... 129.95

TANDY 1000/3000 SOFTWARE

Graphics

pfs:graph. Helps you produce colorful bar, line and pie charts that make your points stronger, your reports shorter, your presentations clearer and your meetings more effective. Whatever kind of chart you need, Graph has the right one. And Graph lets you experiment with different types of graphs to find the best way to display your data. Change from a bar to a pie with just a way to display your data. Change from a bar to a pie with just a few keystrokes. Type in your data and Graph will automatically arrange and display it, scaling your chart and selecting the patterns or colors for you. Graph also saves you time by working hand-in-hand with your other software. You can create charts instantly with data from pfs:file, pfs:plan and others. Since Graph is integrated with the other programs in the pfs family, you can add Graph charts to the documents you create with pfs:write to illustrate an important point.

Tandy 1000/3000. 25-1143229.95

See Express Order Software for other graphics programs, pages 42-47.

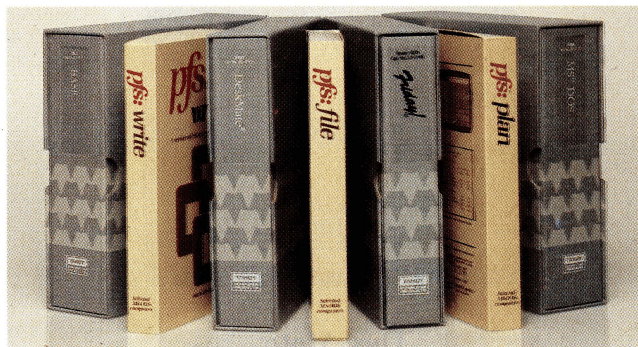
MS-DOS/BASIC/DeskMate

MS-DOS Version 3.10/GW-BASIC Version 3.11/DeskMate. Tandy 3000 MS-DOS is version 3.10, containing record-locking support for multi-user networking environments. Tandy 3000 GW-BASIC is Microsoft version 3.11 BASIC which provides record locking support and is upward-compatible with Tandy 1000 GW-BASIC. DeskMate is a Tandy integrated software package that allows you to perform many functions of computing, including word processing, spreadsheet, data base, communications, calendar and mail.

Tandy 3000 HD. 25-4101229.95

MS-DOS Version 3.20/GW-BASIC Version 3.20/DeskMate II. Tandy 3000 MS-DOS is version 3.20, containing record-locking support for multi-user networking environments. Tandy 3000 GW-BASIC is Microsoft version 3.20 BASIC which provides record locking support and is upward-compatible with Tandy 1000 GW-BASIC. DeskMate II is a Tandy integrated software package that allows you to perform many functions of computing, including word processing, spreadsheet, database, communications, calendar and mail.

Tandy 3000 HL. 25-4103199.95



Database Management

Friday. An easy-to-use, easy-to-understand package that supports file management and report writing. Enter data using the standard format or prepare a custom screen format. Report formats can be customised. Temporarily sort data for display or reporting without affecting the sorted file. Allows math on fields and does totals and sub-totals. Requires 128K, two disk drives.

Tandy 1000. 25-1149749.95

pfs:file. A very simple way to create and organise your own business or personal filing system. You decide how your records are to appear by simply organising information in "forms" that you design right on the display screen. Store, retrieve and review information in a fraction of the time it would take with a conventional filing system. Requires two disk drives.

Tandy 1000. 25-1140229.95

pfs:report. A powerful analysis tool that creates presentation-quality tabular reports from sales, inventory and other data stored in pfs:file. Sort from any data category and calculate averages, totals, subtotals and more. Prints in alphabetical or numerical order with automatic centering and justification.

Tandy 1000. 25-1141229.95

dBASE II. Powerful relational database management for easy manipulation of data using English-like commands. You can add, delete, edit, display and print your information. And you can change the file format at any time without re-entering data. Provides a maximum of 65,535 records per database file and 1000 characters per record. Requires 256K.

Tandy 1000/3000. 26-5352399.95



Find the Powerful Applications You Need with Tandy's Express Order Software Service

(see page 42)

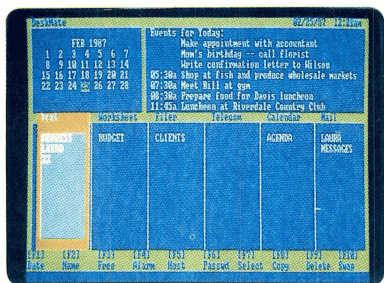
Your local Tandy Computer Centre/Store has the most complete selection of software available.

Our exclusive Express Order Software service brings you the hottest-selling packages — each one performance-proven and professionally supported by the software manufacturer.

Come in today to your local Tandy Computer Centre or Tandy Store to see latest additions in the EOS list.

In this list, you can choose from powerful accounting, word processing, spreadsheet analysis, database management, integrated software and multiuser packages. You'll also find the best in personal and educational software, plus exciting games. Tandy Computer Centres/Stores are your one-stop software headquarters. Come in today!

TANDY 1000/3000 SOFTWARE



DeskMate

The system utilises the Tandy 1000 control keys, so there are no complicated commands to memorise. Each day you'll be greeted by a menu that displays a calendar, appointment schedule and a list of each file stored for every function.

Text. Text processing made simple. Control-key editing features make it easy to compose and edit text right on the screen. Then print correction-free originals with an optional printer.

Worksheet. This electronic spreadsheet uses simple "plain English" entries to make complex calculations instantly! View countless "What if. . .?" situations in seconds. You can print all or a portion of your spreadsheet. A valuable planning tool for everything from personal finance to marketing.

Filer. Create a name and address file, a small inventory list and more. Simple commands let you create and find files easily. You can sort files by one or more fields and also print your files in any order.

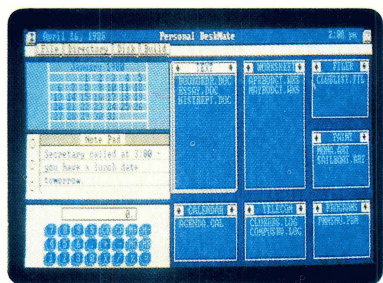
Telecom. By adding an optional modem, DeskMate lets you communicate with a host computer, information service or another terminal. Information you receive can be saved, printed or stored on diskette for later reference. You can also send your files to other computers. TELECOM will even dial the phone number of anyone listed in FILER at the touch of a key!

Calendar. This part of DeskMate lets you set up an agenda for a month, as well as set your daily appointment calendar. Finding, adding and deleting events is easy. And you can also place events in an alarm file that will trigger an alarm through the Tandy 1000 built-in speaker.

Mail. This special program lets you send and receive messages to and from other DeskMate users over the phone.

DeskMate software comes with a thorough, easy-to-understand tutorial manual, a reference manual and quick-reference card. Telecom and Mail require modem.

Tandy 1000 Included with CPU.



Personal DeskMate

An easy-to-use, graphics-oriented program with pull-down menus and "dialogue boxes" for selecting functions. Includes Text, Worksheet, Filer, Calendar, Telecom and Paint, a graphic picture editor. A Phone Directory, Calculator and Notepad may be accessed any time. TELECOM requires a modem.

Tandy 1000 EX. Included with CPU

DeskMate II

Includes all the features of DeskMate with the addition of a task-switching feature that allows the user to alternate between DeskMate II and another program with a few keystrokes.

Tandy 1000 SX Included with CPU
Tandy 3000. Included with MS-DOS (25-4103, 199.95)

Word Processing

Scripsit®. Prepare memos, letters, reports or manuscripts, then print as many correction-free originals as you need. All the features of a dedicated word processor with an easy-to-use command structure using function keys. Function key labels appear at the bottom of the screen. A built-in spelling verifier/corrector from Houghton-Mifflin. Standard features include global search, block move or copy, automatic headers and footers, centering, justification, on-line help and undo commands. Advanced features include proportional spacing, multiple fonts, merge files, column manipulation, boilerplating and more. Requires 256K and two disk drives.

Tandy 1000/2000. 25-1155 699.95
Tandy 3000. 25-3171 649.95

pfs:write. Easily create reports, letters and memos with advanced editing features and page headings and footers, centered text, right or left justification and more. The monitor displays boldface and underlined text. Best of all, pfs:write can use information stored in pfs:file to personalise form letters and even address the envelopes. Documents can be illustrated with charts created by pfs:graph or tables from pfs:report.

Tandy 1000. 25-1142 229.95

Microsoft Word. A high-performance word processing program with the capabilities to quickly handle complex writing tasks. You can produce high-quality business documents that make a good first impression, fast and easily. You don't have to print the document to see how it will look, WORD shows you right on the screen. With glossaries, style sheets and a flexible merge, you can quickly put together the most complex document.

Hardware Requirements: 256K and two floppy disk drives.
Tandy 1000. 25-1153 749.95

Spreadsheet Analysis

Microsoft Multiplan. An incredibly easy-to-use decision-making tool. Ideal for profit and loss projections, budgeting and sales forecasts. This popular "second-generation" spreadsheet lets you consolidate related worksheets so that information is transferred between them automatically. You can assign plain-English names to any column, cell or area, vary individual column widths, centre numbers and text within a column or align decimals. Sorting can be performed in alphabetical or numerical order. Cells can be set up individually, by row, column, block — or globally. Displays up to eight windows on the screen. Includes on-line help and a tutorial manual. Multiplan can directly utilise your current VisiCalc files.

Tandy 1000. 25-1152 399.95

pfs:plan. Lets you organise a spreadsheet for planning, tracking, analysing and reporting numerical data. You can even print a copy of your worksheet in a document produced with pfs:write.

Tandy 1000. 25-1144 229.95

Lotus 1-2-3. An easy way to go from spreadsheet to graphics to information management — instantly! Change your spreadsheet data; then graph it in seconds. Search and sort data in your spreadsheet. "Macro" keys let you substitute a single keystroke for a long sequence. One keystroke brings you on-screen help. Features 256 columns and 2048 rows in spreadsheet and 2000 records in database. Requires 256K and graphics card.

Tandy 1000/3000. 25-1145 1499.00

TANDY 1000 HOME SOFTWARE

Utility

Tandy 1000 Disk Drive Diagnostic Tester. Program analyses Tandy 1000 Disk Drive and does diagnostic testing for Rotational speed, clamping, index sensor position, head alignment and read/write accuracy.

Tandy 1000. 26-1370 69.95

Communications

DeskMate Telecom mode, see page 22

Viatel, others Express Order Software, see page 42-47

Computer Tutorial/Training

The FUNDamentals. Experience the FUNDamentals of computer hardware, software, DOS concepts and commands, DeskMate, and much more in an interactive game environment designed specifically for the Tandy 1000. Features 16-color graphics, sound, and animation. A must for the first time computer user and helpful for the seasoned user as well.

Tandy 1000 EX. 25-1167 (T1000 SX: 25-1166) 69.95

Wizard of Id's Wiz Type. Johnny Hart's Wizzard of Id, Spirit, and Bung help users practice typing characters, words, and paragraphs. Learn the correct fingering while building rhythm and speed. Great for beginners or professional typists who want to brush up on their skills.

Tandy 1000. 25-1114 79.95

Flight Simulator. A real-time flight simulation program. The simulation considers 35 important aircraft characteristics and includes an out-the-window three-dimensional dynamic flight display and extensive flight controls.

Tandy 1000/2000. 26-5379 129.95

Educational/Training

Fraction Fever. Helps children develop an understanding of fractions. Kids hop an animated "pogo stick" to match the correct picture with the fraction shown on the screen.

25-1103 74.95

Kidwriter. Your children create their very own story book with colorful scenes, text and music. The picture-stories can be saved on disk and loaded again at a later time.

25-1105 74.95

Pipes. Arlo the Plumber needs your help to bring water to the people of Gilroy. Help him choose pipe from the factory, connect them to the houses and tie your new system to the water supply. Be frugal and plan your systems well, or you'll both end up all wet. Levels of difficulty increase with the number of houses in Gilroy. 25-1108 54.95

Learning with Leeper. Leeper will lead your children through four award-winning preschool games and help prepare them for reading, writing and math. Features shape matching, counting, eye-hand coordination and creativity skills.

25-1118 79.95

Games

BC's Quest for Tires. An exciting action game featuring characters from the comic strip "BC". Follow Thor as he zips around aboard his prehistoric unicycle trying to rescue the Cute Chick from the hungry dinosaur. 25-1115 79.95

King's Quest. Enter an adventurous world of three-dimensional graphics, sound and animated characters. Guide brave Sir Graham on his quest and return the king's treasures! Different mysteries and obstacles await you each time. 25-1117 89.95

King's Quest II — Romancing the Throne. Enter a strange and wonderful adventure world as you guide King Graham on his quest to free his queen-to-be from a jealous enchantress. Different mysteries and obstacles await you each time you play. Also runs on the Tandy 3000 HL, the IBM PC and PC compatibles. 25-1128 89.95

Pinball Construction Set. Comes with five built-in pinball machines, or choose from 32 game parts to build your own. 25-1112 79.95

Demon Attack. Waves of winged demons are invading. Armed with laser cannons and missiles, you must defend your home from the interplanetary warriors. 25-1110 54.95

NEW! Ghostbusters. Based on the hit movie. Program features the bouncy theme song from the hit movie, voice synthesis and the ever-present danger of The Marshmallow Man. 25-1138 89.95



Fraction Fever, Kidwriter/TM Spinnaker, B.C.'s Quest for Tires, King's Quest I and II, Wiz Type and Learning With Leeper/TM Sierra On-Line/TM Infocom. Demon Attack/TM Imagic. Flight Simulator/TM Microsoft Corp. Pinball Construction Set/TM Electronic Arts. Pipes/TM Activision. Ghostbusters/TM Columbia Pictures. The FUNDamentals/TM Digital Learning System, DeskMate/TM Tandy Corp.

POPULAR COLOR COMPUTER 2®



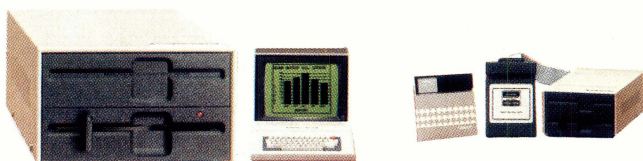
A True Family Computer

299⁹⁵

TV & Program Paks
Not Included

- Write Sophisticated Programs and Create Color Graphics
- Access 16,000 Characters of Memory With Built-In Extended BASIC Language
- Expand to 64K RAM Easily

16K Extended BASIC Color Computer 2. Learn to program or use ready-to-run software. Ideal for a variety of small business and professional uses, too. Simple, one-line commands make detailed color graphics easy to create. Perfect for drawings, designs, charts, engineering applications — even animation! Features 256 x 192 screen resolution (49, 152 pixels); multi-character variable names; string arrays up to 255 characters; full-featured editing; tracing; floating point 9-digit accuracy; trigonometric functions; user-definable keys; specific error messages; and more. Software is available for personal and household tasks, education and entertainment. Easy to expand. Attaches to any TV. Includes tutorial manuals. 240V AC, 50 Hz. 26-3136 299.95



Increase Data Storage

599⁰⁰

156,672 Characters
of User Storage Per Diskette

FD-501 Color Thinline Disk #0. Turn any Color Computer with Extended BASIC into a complete disk system and store over 156,000 characters of data. Write your own programs or use ready-to-run software. Includes 13.3cm double-density, 35-track floppy disk drive; Program Pak cartridge containing the Disk Operating System; cable; blank diskette; manual and operator's instructions. 26-3129 599.00

Second Drive for FD-501. Adds 156K of storage. Requires installation (not included). 26-3130 519.95

Save \$39⁹⁵ When You Buy DeskMate™ and a Disk Drive

Complete package includes the FD-501 Floppy Disk Drive and DeskMate 6-in-1 Program. Reg. separate items \$718.95.

For the Color Computer 2. 26-3129/26-3259 679.00

For the Color Computer 3. 26-3129/26-3262 679.00

Color Computer Upgrade Kits

64K RAM Upgrade Kit. Converts a 4K, 16K or 32K Color Computer to the same memory used in 26-3127.

26-9411/12 179.95*

Extended BASIC ROM Kit. Allows advanced graphics or disk drive capability. Requires 16K RAM. 26-9413/14 114.95*

Color Computer Magazines

Extend your computer knowledge! Two monthly magazines written specifically for the Color Computer available at all Tandy stores.

Co-Co 3.75

Rainbow 4.95

(NOTE: Not all Tandy dealers may be participating)

POWERFUL COLOR COMPUTER 3



**Superb Graphics Resolution and
Uncompromising Performance
at An Incredible Price**

449⁹⁵

Monitor
Not Included

- Choose From a Palette of 64 Brilliant Colors
- Produce Sharp, Crisp Graphs and Illustrations
- Display 32 x 16, 40 x 25 or 80 x 25 Text
- 160 x 200, 320 x 200 or 640 x 200 Resolution
- Use With a High-Resolution Monitor or Your Own TV
- Expands Easily As Skills and Needs Grow

128K Extended BASIC Color Computer 3. Introducing Tandy's newest version of our famous Color Computer. The Color Computer 3 can be used in a variety of applications such as graphics, programming budgets, word processing, database management, spreadsheet analysis and many others. The Color Computer 3 comes with 128K memory (expandable to 512K) and gives you the advantage of greater programming and data processing power, as well as higher resolution graphics. Simply connect the Color Computer 3 to a high-

resolution monitor — like the new CM-8 monitor (sold separately) — and you can create incredibly detailed charts, graphs and engineering drawings in vivid colors. The special higher graphics mode lets you paint 160 x 200 or 320 x 200-resolution graphics using 16 out of the 64 total colors. Or produce razor-sharp 640 x 200-resolution in 4 colors. The 21 new commands featured in the Color Computer 3's Extended BASIC language allow you to switch between screens, colors and backgrounds at a higher resolution and in a greater variety of colors than any previous Color Computer. When connected to a TV, the Color Computer 3 will display text in a 32-character by 16-line format. Get a 40-character by 25-line or 80-character by 25-line display with a monitor. Best of all, the new Color Computer 3 is compatible with most software and accessories designed for the Color Computer 2 (in the Color Computer 2 mode). Expands easily with disk drives, printer, telephone modem and more. 240V AC, 50 Hz.

26-3334 449.95

NEW! High-Resolution Color Monitor

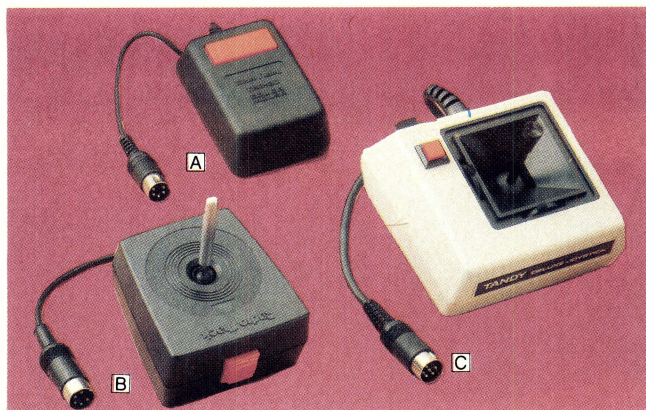
CM-8 RGB Analog Color Monitor. Designed for use with the Color Computer 3. Displays up to 80 x 25 text and 640 x 200 graphics. It is the perfect complement to the superb graphics capabilities of the Color Computer 3. The CM-8 features a 33cm diagonal screen and a built-in speaker with volume control. Includes cable. 26-3215 699.00

SPECIFICATIONS FOR COLOR COMPUTER 3. Microprocessor: 6809E 8-bit. Clock Speed: 0.894 MHz or 1.788 MHz. Keyboard: 57 keys, including Function, Alternate, F1 and F2. Video Display: 16 lines of 32 characters (uppercase only) to 25 lines of 80 characters (uppercase/lowercase). Color graphics capabilities range from 64 x 32 (8 colors) to 640 x 200 (4 colors and background color) with 6 intermediate display formats. High-resolution graphics available through machine language, Extended BASIC or Program Paks. Memory: 128K RAM—internally expandable to 512K. Twenty-one commands in enhanced Extended BASIC. Input/Output: 1500-baud cassette (recorder optional). Two joystick ports. RS-232C serial port (4-pin only). Standard TV (300 ohms), composite monitor and RGB Analog Monitor outputs. Dimensions: 7.6 x 26.2 x 37.5cm. Power: 240V AC, 50 Hz.

SPECIFICATIONS FOR COLOR COMPUTER 2. Microprocessor: 6809E, 8-bit. Clock Speed: 0.894 MegaHertz. Keyboard: 53 keys. Video Display: 16 lines of 32 characters (upper case only). Color graphics capabilities range from 64 x 32 (8 colors) to 256 x 192 (1 color and background color) with three intermediate formats. Memory: 16K ROM and 64K RAM. Input/Output: 1500-baud cassette (recorder optional). Two joystick ports. RS-232C serial port (4-pin only). Standard TV (300 ohms) output. Dimensions: 7.6 x 26.2 x 37.5cm. Power: 240V AC, 50 Hz.

Prices Apply at All Tandy Stores and Participating Dealers

COLOR COMPUTER ACCESSORIES



A Color Mouse. Adds speed and ease to games and graphics creation. Simply "roll" the mouse across tabletop (or any flat surface) to accurately position cursor. You can use it alone or with a joystick. 26-3025.....79.95

B Joysticks. Our lowest-priced joystick. Now players can experience the fun and excitement of games at the same time. Fast 360° movement! Single-shot button. 26-3008 Pair/34.95

C Deluxe Joystick. Our best! Patented stick mechanism gives you more accurate cursor control and quicker response. Dual-axis trim controls adjust to your touch — allowing you to "fine tune" joystick to your game, business and graphics software. Select "spring-centering" or "free-floating" operation. 26-3012 Each 49.95



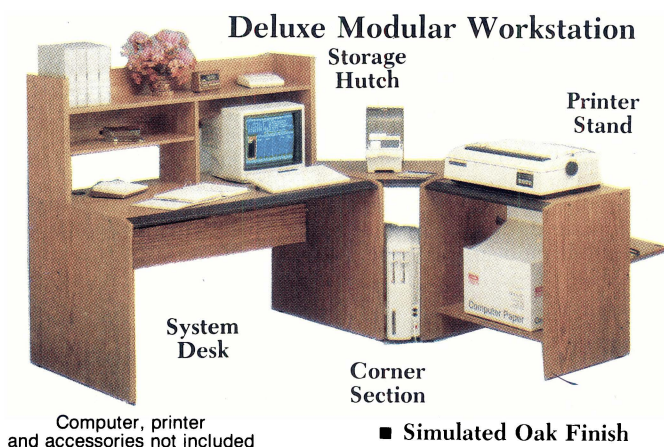
A Multi-Pak Interface. Connects up to four Program Pak™ cartridges to your Color Computer at once! No more plugging in and unplugging cartridges. Connect disk drives and other accessories too. Change between slots with selector switch or under program control. 26-3124 179.95

B TV RF Modulator. Converts signals from a computer to VHF for reception on a standard TV. 1k/75-ohm video input selector matches most equipment. RCA-type phono jacks for video and audio input. 75-ohm "F" connector for output to TV. AC power. 15-1273 69.95

C Deluxe RS-232 Program Pak. Frees serial port for optional printer while you communicate with major information services and with other computers over telephone lines. Software is built-in. Requires modem. 26-2226 179.95

Computer System Furniture

Modular System Furniture for Your Home or Office Workstation



Computer, printer and accessories not included

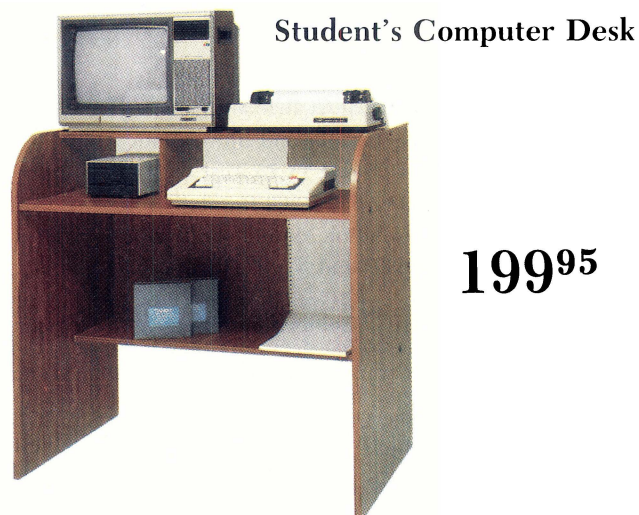
■ Simulated Oak Finish

System Desk. Spacious design. Twin cable management slots for easy connections. Adjustable glides. 68.58 x 126.36 x 74.67cm. 26-1356 459.95

Storage Hutch. Mounts across the full width of the system desk. With adjustable "second shelf" for either side. 26-1359 209.95

Corner Section. Connects system desk and printer stand for a convenient "work corner". Attaches to either side of desk. 26-1358 114.95

Printer Stand. Includes bottom-feed paper slot, fold out paper catch and paper storage shelf. Adjustable glides. 68.58 x 71.62 x 49.53cm. 26-1357 349.95



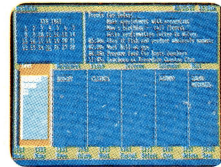
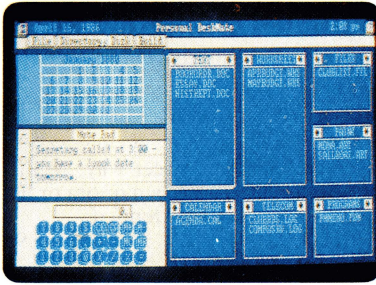
Student's Computer Desk

199⁹⁵

- Suits Most Computer Hardware
- Tough, Durable Construction

Give your computer an established home, rather than a temporary one. Stylish cabinet finished in attractive woodgrain vinyl. With gap between desktop and back panel to allow paper to pass from lower storage shelf to printer. Ready to assemble — no special tools required. Measures 90 x 93 x 60cm. 26-9408 199.95

COLOR DISK SOFTWARE



DeskMate for Color Computer 2 features 7 productivity tools on one disk. 26-3259 139.95

NEW! DeskMate 3. An enhanced version of DeskMate for the Color Computer 3. Color Computer DeskMate 3 is an integrated package of seven commonly used personal productivity applications on one disk: Text, Ledger, Index Cards, Paint, Telecom, Calendar and Calculator. DeskMate lets you easily select an application (identified by name and icon) with your mouse, joystick or keyboard arrow keys. Requires 128K Extended Color Basic and disk drive. 26-3262 119.95

Included in DeskMate:

Text. A general-purpose text entry and editing program that performs search and replace; file merge; and block select, copy and delete. It's ideal for writing correction-free letters, memos and short reports.

Ledger. A simple spreadsheet which includes an easy-to-use menu and automatic column formatting. You can use Ledger to do budgeting, sales forecasting, profit and loss projections and other "What if...?" calculations.

Index Cards. A personal filing system. You can enter and edit data and perform simple sorts and searches. It's ideal for keeping track of names and addresses.

Paint. A four-color picture editor to create graphics screens. You can easily create lines, shapes, patterns, fill in areas with color and enter text. Using Paint, you can create colorful charts, graphs, designs, even "doodles" on your screen, then print a copy on a dot-matrix or ink-jet printer.

Telecom. A communications program to access national information services, plus transmit and receive ASCII files from other computers by phone (requires modem). Telecom makes it easy to access computer bulletin boards.

Calendar. A simple monthly calendar that displays "to do's" for any date. Calendar is an easy way to organise your day.

Calculator. A four-function calculator available within any application. This program is similar to a printing calculator. Figures and calculations scroll up the screen. Includes printer support.

DeskMate. Comes complete with an easy-to-understand manual.

Application, Educational, Programming Tools and Game Programs on Disk



Cash Budget Management. A sophisticated personal or small business bookkeeping program. Features ready-to-use income, expense and cash categories — and you can define your own. 26-3261 119.95

Dynacalc. A powerful electronic spreadsheet. Features up to 256 columns or 256 rows of cells. Requires 64K and OS-9 DOS. 26-3275 179.95



Cookbook. Two programs in one — an all-purpose menu planner and recipe index file. 26-3257 79.95

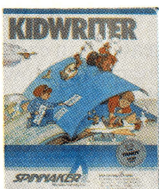
Flight Simulator. Learn the basics in manual control of ailerons (pitch and roll), compass readings, take-off and landing and more. Requires 64K and joystick. 26-3108 69.95

NEW! Zone Runner. Transport various items between the outposts of the galaxy while avoiding the patrols, pirates, escorts and mines. 26-3286 59.95



Shamus. Follow the hero, Shamus, as he searches for the evil Shadow in his hide-away! Go through a maze of passages and rooms, fight Whirling Drones, Snap-Jumpers and Robo-Droids with your deadly lon-Shims. 26-3289 79.95

Kid Writer. A story book game where children can type a story about the picture on the screen. 26-3249 79.95



OS-9 Disk Operating System. Accesses the entire memory of our 64K Extended BASIC Color Computer with editor assembler. 26-3030 149.95



NEW! OS-9 Level II. Same as OS-9, but with enhancements for Level II to support 512K RAM and dual speed. 26-3031 129.95

OS-9 Profile. A personalised electronic filing system. Requires 64K and OS-9 operating system. 26-3274 99.95



D.L. LOGO. Programming language designed to run under OS-9. Includes "MUSIC" to play songs with up to 4 voices, "SAY" for support of Speech/Sound cartridge, and joystick support. 26-3033 199.95

PASCAL-09. A complete implementation of this structured programming language. Requires OS-9 DOS. 26-3034 179.95



BASIC-09. An enhanced version of standard BASIC written for the 6809 microprocessor. Includes advanced features derived from PASCAL. Requires OS-9 DOS. 26-3036 349.95

C Compiler. A high-level language that produces assembly language source code for the 6809 microprocessor. Requires OS-9 DOS. 26-3038 179.95

TRSCOPY. Allows transfer of text files between "OS-9" disks and "Color Computer Disk Basic" disks. 26-3263 49.95



TSEdit. A high-resolution screen editor that allows upper and lower case in lines from 32-80 columns. 26-3264 64.95

TSWORD. A format program that forms a powerful OS-9 word processing package when combined with TSEdit. Illustrated menus. Requires 64K. 26-3267 79.95

COLOR COMPUTER SOFTWARE

Application Program Pak™ Educational & Games Program

NEW! Color SCRIPSIT II. Color SCRIPSIT II is a word processing system that includes an editor to enter and edit text and text formatting commands. The view mode allows the user the ability to change the format control information while viewing the page. 26-310959.95

NEW! Color File II. Our new, improved version of Color File! With Color File II you can easily and quickly store, retrieve and use various types of important data, such as addresses, warranties and personal records. You can easily alphabetise, select, examine, print, change and save your information. Cassette recorder and minimum 16K required. 26-311049.95

Personal Finance II. This easy to use household budget program features 26 major expense categories. Review your expenditures on a year-to-date or category basis. 26-310659.95

Atom. Teaches the names of elements, their atomic numbers, configurations and main properties. Includes beautiful wall poster. (Joysticks required.) 26-3149.....39.95

Kids on Keys. Your kids will enjoy learning with the computer as they identify numbers, letters and words. 26-316759.95

Facemaker. An exciting game to help your kids learn computer basics while they create an animated face. 26-316659.95

Kindercomp. Introduce your children to computer graphics! Create vivid color pictures and exciting sound effects. 26-316859.95

Fraction Fever. An exciting math contest! Develops a real understanding of fractional relationships. 26-316959.95

Alphabet Zoo. Children learn to associate letters of the alphabet with the sounds they represent in two humorous games. 26-3170.....69.95

Editor/Assembler. Develop 6809 software programs or subroutines. You get trial assembly of object code and execution of your program in memory before final assembly to tape, an editor that enables you to change your program and reassemble, and Z-Bug for quick and easy testing. Requires 16K. 26-3250.....99.95

Reactoids. There's been a meltdown at a fusion reactor! Take control of the reactoid to contain the atoms and prevent a disaster. 26-309249.95

Micropainter. Turn your Color Computer into an "electronic coloring book"! Become another Van Gogh or Rembrandt. Great fun for the whole family! Load a picture in and "paint" what appears on the video screen. Three palettes, each with four colors. Save results on tape with an optional cassette recorder. With 8 pictures (more available). Joysticks optional. 26-307759.95

Cyrus. Improve your chess skills! Change play levels during a game, reject computer's moves, take back moves, even play for both sides. Requires 32K (CoCo2). 26-3064.....79.95

Donpan. You're a balloon sailing to Donpan Island. Fight crows, sharks and monsters by exhaling air. With a little help from your friends you'll make it. 26-309749.95

Dungeons of Daggorath. You're pitted against a succession of awesome beasts. Each victory brings you closer to your ultimate opponent — the evil wizard. 26-309359.95

Baseball. Plays just like the real game! You control pitching, running and defense. 26-3095.....49.95

GomuKu and Renju. Two classic oriental games of strategy. Enhance tactical and strategical abilities in a challenge that can take hours of enjoyment. 26-306949.95

Cassette Tape Educational/ Training Games

Cordial Stall. Game which stimulates children's entrepreneurial talents. 16K Extended. 26-79569.95

Math Invaders. Learn math when they play. Multi-level of skills. For ages 6-90. 16K Extended. 26-79579.95

Spelling. Enjoy and practice spelling the correct way. Multi-level of skill. For ages 6-90. You can put your own quota or list of school assigned words for practice. 16K Extended. 26-79589.95

AustQuiz. How much do you really know about your country? Answer geography questions, and correct answers, towns and cities appear on map. 8 programs. 16K Extended. 26-79609.95

Aussie Accountant. Keep your finances up-to-date! Direct-entry records of income and expenditure, keep monthly and yearly totals, make transactions between accounts. Allows up to 150 entries per month (16K), 500 per month (64K). 26-796239.95

Vocabulary Tutor. Match words with their definitions and place words in the appropriate sentences. For years 3-5.

Vocabulary Tutor 1. 26-256814.95

Vocabulary Tutor 2. 26-256914.95

Color Computer Learning Lab. Self-teaching course in standard Color BASIC. 26-315399.95



Speed Racer. Become a Formula One racing driver! Select one of 4 circuits. Race against the clock, the more cars you pass the more laps you go. Pitstop for new tyres. 5 laps and you win. Requires 32K, optional joystick.

26-736234.95



Mystery of the Java Sea. Use an old map and the ship's log book to find lost treasures — including the Java Star ruby! Organise the expedition, gather information, then set off on the dangerous journey. 3 Skill levels. Requires 32K.

26-735334.95



Eight Ball. Pool from the comfort of your armchair! Line up your cue, sink the coloured balls. Choice of 3 screens; buff green or black. Joystick required.

26-731134.95

Mudpies. What fun — Cuthbert throws mudpies at the circus clowns! Help him run away without getting caught. Requires 32K, optional joysticks.

26-736434.95

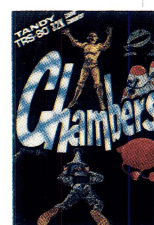


Scramble. Penetrate enemy scramble system and destroy their base! Dodge obstacles, missiles. With sound effects. Requires optional joystick.

26-730634.95

King Tut. Go deep into King Tut's tomb in search of treasure! Beware of snakes, King Tut's ghost. 5 skill levels.

26-731334.95



Operation Safras. Modern-day 3-part adventure as secret agent Rupert James Pettigrew tries to save his fellow agents then locate the legendary Safras sword and return it to its rightful place. With sound effects. Requires 32K.

26-735534.95

Chambers. Destroy evil creatures in each room, go to the reactor room and blow up the base! 20 series of chambers, hundreds of rooms, 50 different creatures. Outstanding sound and graphics. Requires 32K, optional joystick.

26-736134.95

COMMUNICATE WITH TANDY MODEMS

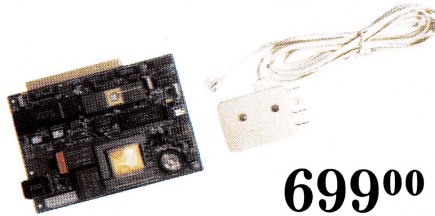
Tandy V21/23



399⁹⁵

Gain access to Telecom's Viatel for a host of services. Also links to bulletin boards and other videotex services. 300 bits per second or 1200 bits per second receive, 75 bits per second send, 240V AC at 5 watts. Simple to install and fully Telecom approved. 26-9404399.95

Internal Intelligent Modem for Your Tandy 1000/3000



699⁰⁰

Direct connect modem eliminates acoustic interference and data corruption. With auto-answer auto-dial and auto-disconnect. Includes VTEX2 software for Viatel and other video text services. 300 baud full duplex and 1200/75 baud full duplex (videotex). With Telecom approval. 25-9402.....699.00

External Intelligent Modem 300/300, 1200/75 Auto-Answer Auto-Dial

749⁰⁰

NEW! It's exclusive to Tandy! Designed and manufactured for use at 300 baud full duplex (approximately 30 characters per second). Talk to other computers, bulletin boards, information services and data bases, and at 1200/75 (1200 characters per second from the host), it'll connect to Viatel and other videotex services.

When used with the specialised software listed below, the Tandy intelligent modem will automatically dial your required data base or answer an incoming modem call. 26-9419749.00



Until now, your personal computer was generally limited to the information you could input or to the software available. Now Telecom Viatel opens up a whole new world for PC owners.

Using the existing telephone network, Viatel distributes a wide range of information and services from a central computer direct to your home or office.

You can bank from home. Send messages to other Viatel users. Send telexes. Follow the stockmarket, buy and sell shares. Check economic indicators. Bet on the races. Make bookings for airline flights and motels. Get news updates. Order goods. Use bulletin boards.

Express Order Viatel Software for Your Tandy Computer

Model 4

99⁹⁵

Viaterm software has been developed in Australia for the Tandy Model 4 computer. It's designed to give the Model 4 user access to the world of Viatel communications supplied by Telecom.

To use this software, the user will need a 64K twin or single disk drive Model 4 or 4P fitted with an RS232C interface (standard on most Model 4s), a 26-1408 cable to connect the computer to the modem.99.95

Color Computer 2or3 99⁹⁵

CoCoTex is a color computer software package which will bring the new and exciting world of Videotex into your home. When used in conjunction with a 1200/75 Baud (V23) modem, it'll turn your color computer into a powerful, easy to use terminal. Some features of CoCoTex Version 3 are: 40 character, 23 line display; upper/lower case display; full cursor control support; single/double height characters supported; page store/recall facility; even parity error checking supported; single key controls supported; support for intelligent modems with auto dialling.99.95

MS-DOS Tandy 1000/2000/3000

235⁰⁰

VTEX2 is a software package that will allow Tandy 1000's, 2000's and 3000's to communicate with Telecom's Viatel network using an optional V2123 modem. The software has been written and developed in Australia. It is also a program for displaying Videotex data on personal computers that use MS-DOS. Powerful facilities are provided for storing, searching through and processing frames of Videotex data.235.00



Express Order Modems from NetComm

The NetComm 1200 \$1058

A high performance 1200 bps modem at an affordable price. Works at variable speeds with state-of-the-art digital signal processor. With fully automatic or manual configuration and dialling and fixed compromise equalization to improve performance. Link up with many different services — talk to other computers. Compact elegant design and optional phone handset for interworking voice traffic.1058.00

SmartModem 123A \$1355

The first of a new breed of modems enabling access to the 3 most popular baud rates. Access bulletin boards at 300 full duplex, Viatel at 1200/75 full duplex as well as OTC's Midas or Telecom's Austpac at 1200 full duplex. Multispeed, multi standard with built-in digital signal processor. Features long-term memory that retains configuration and settings, even when switched off. SmartModem 123A .1355.00

SmartModem 1234A \$1651

It's simply the ultimate modem. Accesses the broadest possible range of baud. Has 2400 baud to allow high speed point-to-point file transfer and access to data-bases. Offers unparalleled throughput and accuracy with high reliability. Multi speed and standard with long term memory and auto-dial, disconnect and answer. With internally mounted speaker and 8 LEDs to give audio and video control.1651.00

TANDY PORTABLE COMPUTERS



Our Popular Tandy 200

1399⁰⁰

- Multiplan Built In
- 24,000-Character Memory

Tandy 200. A powerful problem solver. For complex spreadsheet analysis and calculations, we put popular Multiplan software into the Tandy 200's permanent memory. Do sales forecasts, profit-and-loss projections, budgeting, pricing, engineering calculations and more. An improved version of the Model 100's easy-to-use word processing program makes Tandy 200 especially useful for memos, reports and correspondence. Four other "instant-on" programs are a personal appointment calendar, address and phone directory. You can even create your own programs in BASIC. The Tandy 200's high-contrast flip-up liquid crystal display has 240 x 128 resolution for big, clear graphics, or 16-line by 40-character text. Includes parallel printer, RS-232C, cassette and bar code reader interfaces. 26-3860 1399.00

SPECIFICATIONS. Microprocessor: 8-bit 80C85 CMOS. Clock Speed: 2.4 MHz. Memory: 72K ROM, expandable to 104K; 24K RAM, expandable to 72K in banks of 24K. Keyboard: Full-sized 56-key typewriter style with embedded data pad, plus 8 programmable function keys, 4 command keys and 4 cursor control keys. Display: 16 x 40 liquid crystal display, upper and lower case ASCII characters, 240 x 128 dot-matrix graphics. Input/output: Parallel printer interface. RS-232C serial communications interface. Cassette tape interface. Standard bar-code reader interface. Dimensions: 5.5 x 29.8 x 21.6cm. Weight: 2kg. Power Supply: Operations — Up to 16 hours on 4 "AA" alkaline batteries, and can use nickel-cadmium rechargeable batteries with minor additional-cost modification. Optional AC/DC charger/adaptor available. Memory—Internal rechargeable nickel-cadmium batteries will retain memory for up to 15 days with power off.



Slimmer, Lighter Tandy 102

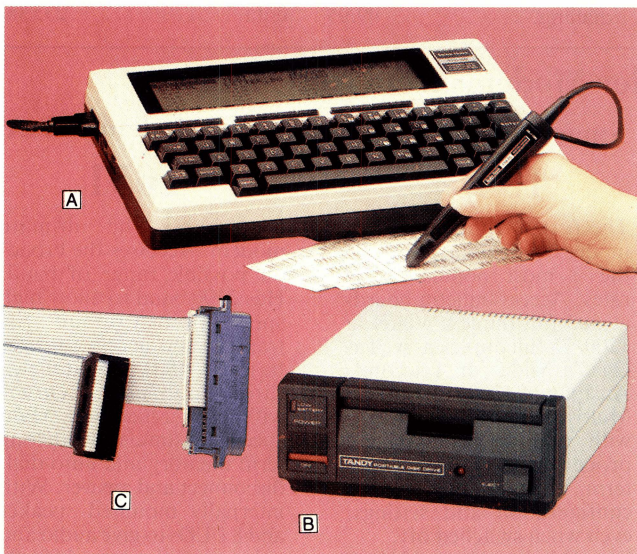
999⁰⁰

- 24K Memory
- 40 x 8 Display
- Five Built-In Management Programs

Tandy 102. We've redesigned our best-selling portable — the famous Model 100 — into an even smaller package. But we've retained the same remarkable features, including five instant-on programs and an 8 x 40 display — all built in. Use the Tandy 102 as a personal word processor, address/phone directory and appointment calendar. Access other computers or national information services by phone with the RS232C interface and optional modem and communications program. You can even write your own programs in BASIC. Includes parallel, RS-232C, cassette and bar code reader interfaces. Only 1.36kg. Requires four "AA" batteries. 26-3803 999.00

SPECIFICATIONS. Microprocessor: 8-bit 80C85 CMOS. Clock Speed: 2.4 MHz. Memory: 32K ROM; 24K RAM, expandable to 32K. Keyboard: Full-size 56-key typewriter style with embedded 10-key datapad, plus 8 programmable function keys, 4 command keys and 4 cursor control keys. Display: 8 x 40 Liquid Crystal Display, upper and lower case ASCII characters, 240 x 64 dot-matrix graphics. Input/output: Parallel printer interface. RS-232C serial communications interface. Cassette tape interface. Standard bar-code reader interface. Dimensions: 3.8 x 30 x 21.5cm. Weight: 1.36kg. Power Supply: Operations — Up to 20 hours on 4 "AA" alkaline batteries or optional AC power supply. Memory — Internal rechargeable nickel-cadmium batteries will maintain memory intact for up to 30 days with power off.

Portable 100/102/200 Accessories



- [A] Bar Code Wand.** Ideal for inventory control, billing and couponing. Software drivers callable from BASIC, allow you to read Universal Product Code, 3 of 9, Plessey and other formats. Plugs directly into any Tandy 200 or Model 100 for instant use. 26-1183 179.95
- [B] Portable 8.89cm Floppy Disk Drive.** Add portable disk storage to your Model 100. Fast access to 100K of data on 8.89cm floppies. Initialization software included. Weighs just 793g. Measures 5.8 x 12.45 x 15.75cm. Requires four "AA" batteries or AC adapter (not included). 26-3808 399.95
- AC Adapter.** 26-3804 19.95
- [C] Printer Cable.** Flat, durable cable for connecting your printer to your Tandy 200 or Model 100. 26-1409 29.95
- Model 100 8K RAM Upgrade.** Requires installation. (not included). 26-3816 139.95
- Tandy 102 8K RAM Upgrade.** Requires installation. (not included). 26-3817 34.95
- Tandy 200 24K RAM Upgrade.** Requires installation (not included). 26-3866 399.95

HANDY POCKET COMPUTERS



PC-6 Pocket Scientific Computer

199⁹⁵

- 65 Built-In Scientific Functions
- Programs in BASIC and Assembly Language

Pocket Scientific Computer PC-6. An ideal tool for engineers and students, the PC-6 combines the best features of a powerful scientific calculator and a pocket computer. Performs up to 65 scientific calculations — or write your own programs in BASIC or assembly language. Retains programs and data even when power is off. A built-in Note and Address File keeps important telephone numbers or engineering data and formulas handy. Features an easy-to-read, 24-character LCD. Uses PC-4 Cassette Interface and Printer with PC-5/6 Cable (all sold separately). 8K RAM. Folds up to only 1 x 14.2 x 14.2cm. Includes battery. 26-3672 199.95
8K RAM Module. 26-3674 39.95

PC-6 Cable. Use PC-6 with PC-4 Cassette Interface and PC-4 Printer. 26-3671 29.95

Tandy 200 Programs

Bar Code Writer. Takes input from Model 100 TEXT files and produces bar codes in six forms. Requires 24K, cassette recorder, printer and cables. 26-3895 79.95

Bar Code Drivers. Allows bar code wand to read Interleaved Two of Five, Codabar and UPC-E bar codes. Requires 16K, cassette recorder and bar code wand. 26-3896 45.95

Data Manager. Lets you store, examine, update and list a variety of information — from personal records to appointment schedules. Requires cassette recorder. 26-3886 ... 79.95

Project Scheduler. Divide a large job into individual tasks. Requires 24K and cassette recorder. 26-3893 79.95

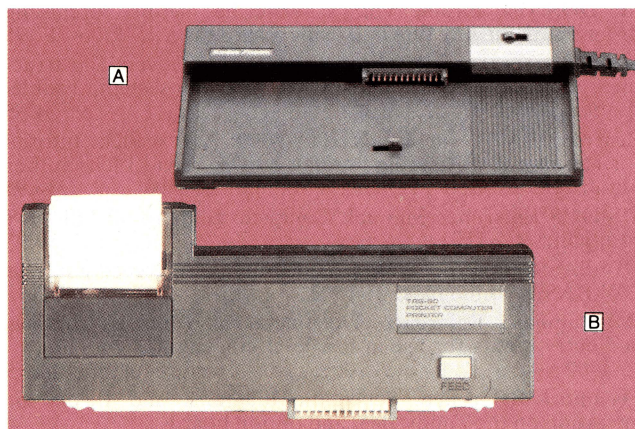
Romulus Chess. Choose from seven playing levels. Requires cassette recorder. 26-3890 45.95

Tandy Code Read/Write. Generates and reads modified NATI code. Requires 24K, cassette recorder, printer, cable and bar code wand. 26-3897 59.95

Text Power 200. Turns your Tandy 200 into a true word processor — much more powerful than the built-in word processing program. Includes advanced formatting capabilities. Requires cassette recorder. 26-3881 79.95

Time Minder. Manage your appointments and expenses effectively or just display a calendar for any month of any year. Requires cassette recorder. 26-3883 79.95

Expand Your PC-4/6 System Easily



A] PC-4/6 Cassette Interface. Load software and store programs and data on cassette tapes. Requires two "AA" alkaline batteries. 26-3651 59.95

B] PC-4/6 Printer. Prints 20 characters per line. 26-3652 149.95

PC-4/6 Thermal Paper. 3.8cm wide. 65-711 Pkg. 5/3.99

Tandy 100/102 Programs

Data Manager (Cassette). Requires 24K memory and cassette recorder. 26-3836 79.95

SCRIPSIT® 100. Features advanced formatting capabilities. Requires printer and cassette recorder. 26-3830 69.95

Calculator. Powerful math "scratchpad" for finance and regular math functions. Requires cassette recorder. 26-3827 34.95

Statistics. Generate reports for descriptive statistics, frequency distribution, histogram, correlation, regression, time series analysis and much more. Requires 32K and cassette recorder. 26-3825 59.95

Executive Calendar. Schedule appointments or display a calendar for any month. Requires cassette recorder. 26-3833 34.95

Multiplan. This ROM program is a portable version of the popular spreadsheet analysis program — does not occupy Model 100 RAM. 26-3829 269.95

Business Decisions. Six programs in one to make decision-making easier. 26-3832 84.95

Function Plotter. Graph algebraic functions of one or two variables with your printer. 26-3834 45.95

Expense/Graph. Create financial reports and graphs. Two programs in one. 26-3837 79.95

Data/Sort. Powerful database management system. A valuable business tool. 26-3838 79.95

Starblaze 100. Command your own spaceship before, during and after office hours. 26-3840 34.95

Project Scheduler. Keep track of important project days, months, years in advance. 26-3843 69.95

Bar Code Writer. Produces six types of bar codes including UPC, Plessy and more. 26-3845 59.95

Tandy Code Reader/Printer. Read and print codes in conjunction with Bar Code Writer. 26-3847 59.95

COMPUTER REFERENCE BOOKS



Tandy 1000

The Complete Guide to the Tandy 1000. Explains how to get the most from your Tandy 1000. Covers IBM compatibility, software, hardware, expansion and more. 25-1505 29.95

MS-DOS: The Basics, Vol. 1. Describes set-up, preparing diskettes, managing files and using a hard disk. 25-1506 . 17.95

MS-DOS: Advanced Applications, Vol. 11. Covers file structure, controlling data flow, personalising your system, troubleshooting. 25-1507 24.95

Learning BASIC for Tandy 1000/2000. An excellent tutorial for learning BASIC programming by Dr. David Lien, author of our famous Model I Owner's Manual. 25-1500 34.95

MS-DOS Reference Manual. Complete guide to all MS-DOS commands. 25-1501 59.95

GW-BASIC Reference Manual. Complete reference guide to GW-BASIC commands. 25-1502 59.95

Programmer's Reference. Documents all BIOS subroutines and entry points for use in low-level languages. 25-1503 17.95

Technical Reference. Schematic diagrams and theory of operation on the Tandy 1000 and option boards. 25-1504 49.95

Model I/III/4

Model 4/4P Technical Reference Manual. 26-2119 39.95

Color Computer

BASIC 09 Tour Guide. A complete reference guide of system commands and lists each BASIC 09 Keyword in alphabetical order. 26-3189 29.95

Rainbow Guide to OS-9. Includes an overview of OS-9, hands-on examples, utility commands set, major programming languages, inner workings of OS-9 and more. 26-3190 34.95

The Color Computer Playground. Features 42 entertaining and useful programs. 26-3196 12.95

Color Computer Quick Reference Guide. Functions, ROM subroutines, handy index and more. 26-3194 4.95

Portable Computers

Tandy 200 Technical Reference Manual. 26-3861 59.95

Model 100 Technical Reference Manual. 26-3810 17.95

The TRS-80 Model 100 Portable Computer. A complete step-by-step learner's manual. 26-3819 28.95

Portable Computing With the Model 100. Emphasizes practical applications of Model 100. Includes cassette tape with 12 programs. 26-3820 28.95

Source Book

Educational Software Sourcebook. A thorough guide to locating and purchasing individual software programs. Includes all aspects of management and tutoring. With complete index. 26-7991 14.95

Color Computer Magazines

Extend your computer knowledge! Two monthly magazines written specifically for the Color Computer available at all Tandy stores.

Co-Co 3.75

Rainbow 4.95

(NOTE: Not all Tandy dealers may be participating)

Reference Books

Dictionary of Microcomputer Terms. Clear, understandable definitions, many with illustrations. Reference section of abbreviations, acronyms and symbols. 96 pages. 62-1392 . . . 5.99

NEW! You and Computers. An easy-to-read introduction for the student or layman to the world of computers. 62-9606 5.99

NEW! Microcomputer Software Buyers' Guide Vol. I. An in-depth coverage of major software packages for spreadsheets, communication, database and graphics products. 62-9607 19.95

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NEW! Personal Computer Software Guide. Includes description of major software packages. For Tandy and other 16-bit PC's. 62-9609 19.95

Computer Science

Computer Reference Handbook. Model I, II, III, 4, 100. Color Computer and MC-10. 344 pages. 62-2314 5.99

Understanding Computer Science, Vol. I. Covers hardware, programming and languages. 256 pages. 62-1383 6.99

Understanding Computer Science, Vol. II. Covers graphics, networks, communications and application design. 256 pages. 62-1395 6.99

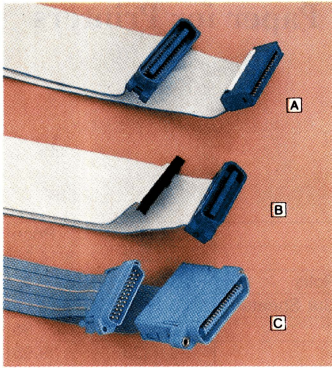
Understanding Data Communications. Explains the transmission of words and symbols from a source to a destination. 256 pages. 62-1389 6.99

Understanding Digital Troubleshooting. Provides basic troubleshooting techniques in an easy-to-learn format. 272 pages. 62-1398 6.99

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Understanding Microprocessors. 296 pages. 62-2017 6.99

COMPUTER/PRINTER CABLES



Parallel Printer Cables

Fig	Use With	Description	Cat. No.	Each
A	Model I/III/4/4P/4D/1000/1000EX	34-pin card edge to 36-pin plug. 3.2m	26-1368	69.95
B	Model II/12/16/16B/2000/6000	34-pin header to 36-pin plug. 3.2m	26-1323	79.95
C	Tandy 3000 IBM PC	DB35 to 36-pin plug. 1.6m	26-1347	79.95

Serial Printer Cables

Fig	Use With	Description	Cat. No.	Each
D	PC-5/6	12-pin to 12-pin	26-3671	29.95
E	Color Computer/MC-10	4-pin DIN to 4-pin DIN	26-3020	7.95
F	DT-100 Terminal	4-pin DIN to DB25	26-1361	34.95

Color Computer/MC-10 Interface Cables

Fig	Function	Description	Cat. No.	Each
E	To modems	4-pin DIN to 4-pin DIN	26-3020	7.95
F	To RS-232 ports	4-pin DIN to DB25	26-3014	29.95

Cassette Recorder Cable

Fig	Use With	Description	Cat. No.	Each
G	Computers with cassette port	5-pin DIN to Audio (3 plugs)	26-1207	10.95

Keyboard Extension Cable

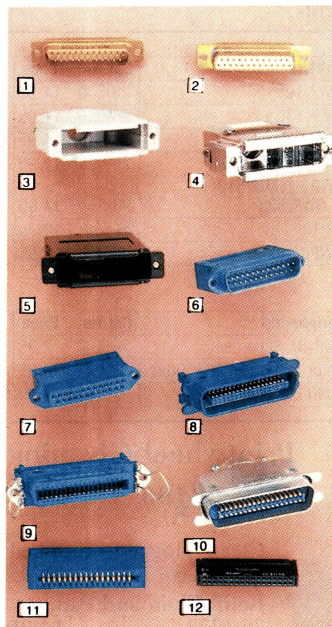
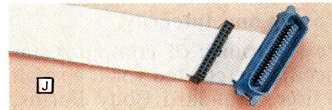
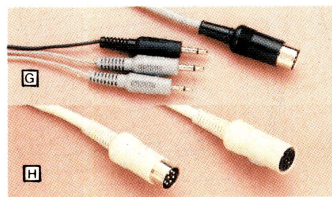
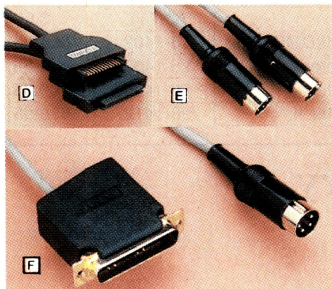
Fig	Use With	Description	Cat. No.	Each
H	Tandy 1000	1.5m extension cable	26-1389	29.95

Model 100/Tandy 200

Fig	Function	Description	Cat. No.	Each
J	To parallel printer	34-pin header to 36-pin plug	26-1409	29.95

Universal RS-232C Communications

Fig	Function	Description	Cat. No.	Each
K	Model III/4/12/1000/2000/3000/6000	Male DB25 1.5m Ribbon	26-1408	44.95
M	Tandy 3000 serial cable	DB89 to DB25 1.8m round	26-1399	69.95
N	For Model 12/1000/2000/3000 6000 or with 26-1497	3m round cable 7.6m round cable 15.2m round cable 30.4m round cable	26-1490 26-1491 26-1492 26-1493	69.95 89.95 119.95 159.95
O	Joins cables together	RS-232C Cable Connector	26-1495	59.95
P	Allows two CPUs to communicate directly through "modem" software	Null Modem Adapter	26-1496	59.95
Q	Allows use of round RS-232C cables with Model III/4/DT-1	20.3cm flat extender	26-1497	59.95
	Two RS-232C Cables	Connector	276-9704	29.95
	Two Computers & RS-232C Cable	Null Modem	276-9705	24.95
	Male to Male RS-232C	Connector	276-9703	29.95
	Mini Patch	Connector	276-9702	34.95
	Mini Tester	Tester	276-9701	49.95
	Two Lap Computers & RS-232C Cable	Null Modem	276-9706	24.95



Computer and Peripheral Connectors

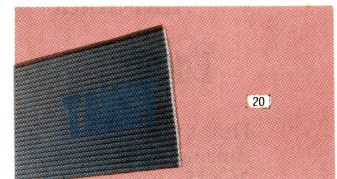
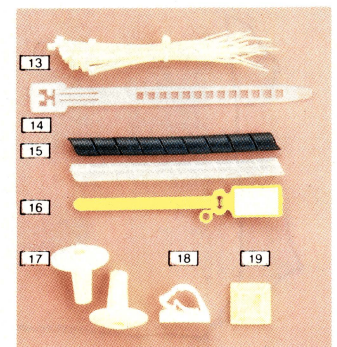
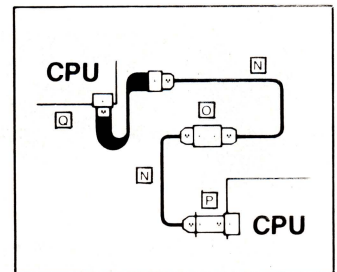
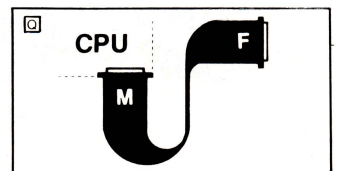
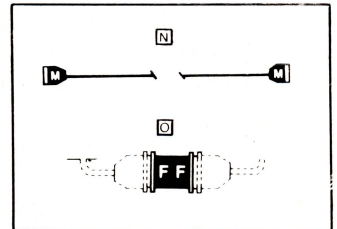
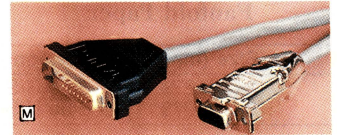
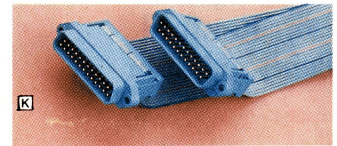
[1] 25-Position Solder-Type Submini "D" Male Connector.	
276-1547	4.99
[2] 25-Position Solder-Type Submini "D" Female Connector.	
276-1548	5.95
[3] Hood. 276-1549	4.99
[4] Shielded 25-Position Hood. 276-1536	4.99
[5] Multi-Purpose Hood. 276-1520	4.49
[6] 25-Position Solderless Submini "D" Male Connectors.	
276-1559	9.95
[7] 25-Position Solderless Submini "D" Female Connectors.	
276-1565	11.95
[8] 36-Position Male Printer Connector for ribbon cable.	
276-1533	9.95
[9] 36-Position Female Printer Connector for ribbon cable.	
276-1523	11.95
[10] 36-Position Solder-Type Printer Connector.	
276-1534	9.95
[11] 34-Position Solderless Card-Edge Connector. 276-1564	7.95
[12] 34-Position Header Connector. 276-1525	4.99
26-Position Header Connector. 276-9525	4.99

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[13] 10cm Self-Locking Nylon Wire Ties. 278-1632	Pkg. of 30/2.59
[13] 20cm Self-Locking Nylon Wire Ties. 278-1631	Pkg. of 30/3.39
[13] 30cm Self-Locking Nylon Wire Ties. 278-1642	Pkg. of 30/4.59
[14] AC Cord Ties. 278-1646	Pkg. of 6/99c
[15] Spiral Wrap. 1.5m clear, 1.5m black. 278-1638	3.49
[16] Cable Tie/Marker. 278-1648	Pkg. of 10/4.99
[17] RG62 Cable Feedthrough Bushing. 278-1643	Pkg. of 2/79c
[18] Universal Cable Clip. 278-1639	Pkg. of 10/4.99
[19] Wire Tie Mounts. 278-441	Pkg. of 10/2.89

RS-232 Ribbon Cable

Fig	Conductors	Cat. No.	Price
[20]	26	276-9772	metre/3.29
	34	276-9773	metre/3.99



PRINTER/COMPUTER SUPPLIES

Stock up Now
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Printer Paper



Fanfold Paper

Size (mm)	Design	Quantity	Cat.No.	Price
241 x 279	Blue H/S	1000 sheets	26-9317	39.95
381 x 279	Blue H/S	1000 sheets	26-9315	39.95

Wordprocessing Paper*

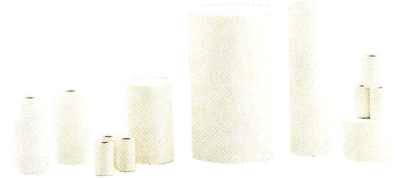
Size (mm)	Design	Quantity	Cat.No.	Price
241 x 279	Blank White	1000 sheets	26-9316	39.95
241 x 279	Quartz	250 sheets	26-9318	19.95

*All wordprocessing Paper has "INVISIBLE" vertical edge perforations.

Fanfold Labels

1-Wide. Package of 1000. 26-1328 15.95

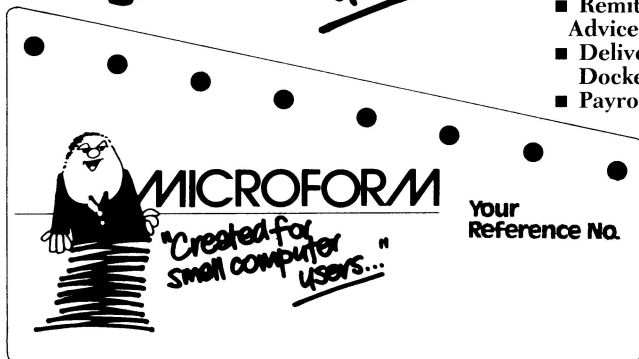
Roll Paper for Printers



Printers	Cat.No.	Price
CGP 115	26-1428	3/14.95
CGP 220 Rolls	26-1333	3/29.95
CGP 220 Cut Sheets	26-1341	2.50/17.95
TP 10	26-1332	2/7.95
TRP 100	26-9338	39.95
PC 1	26-3506	4.95
PC 2	26-3606	5.95
PC 4/6	65-711	3.99
LPI/III/IV/VIII/DMP 200	26-1402	2/34.95
Plotter/Printer	26-1407	17.95
Quick Printer	26-1405	69.95
Quick Printer II	26-1412	2/10.95

Standard Stock Computer Stationery

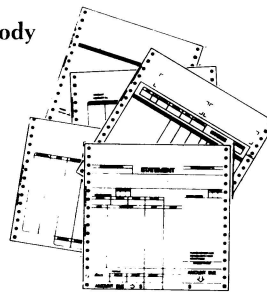
*"Created for
small computer
users..."*



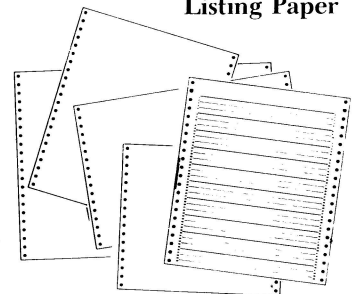
Your
Reference No.

Standard Body
Forms

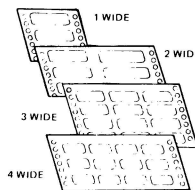
- Invoices
- Statements
- Remittance
- Advices
- Delivery
- Dockets
- Payroll



Listing Paper



Self Adhesive Labels

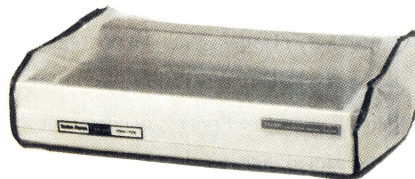
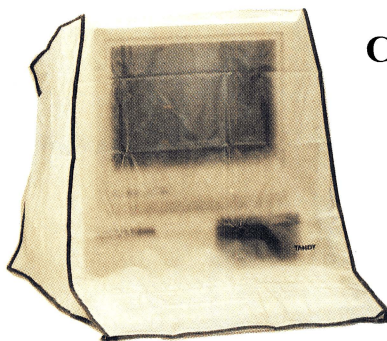


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Dust
Covers



For Keyboards	Cat.No.	Price
Model III/4/DT-1	26-1342	29.95

Computers	Cat.No.	Price
Color Computer 2/3	26-532	10.95
Tandy 1000/2000/3000	26-541	18.95
Tandy 1000 EX	26-543	9.95

Printers	Cat.No.	Price
DMP 105	26-530	11.95
DMP 130	26-536	11.95
DMP 430	26-535	14.95
DMP 2100/2110	26-525	14.95
DWP II/DWP 510		
DWP 520	26-508	14.95
TP 10	26-531	10.95
DWP 210	26-527	8.95

Peripherals	Cat.No.	Price
CCR 81 Recorder	26-517	7.95
Color Computer Disk Drive	26-542	9.95
1000 EX Drives	26-544	9.95

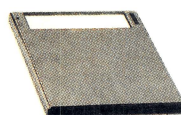
Anti-Static Spray

14⁹⁵



Helps eliminate problem-causing static. Safe. 473cm³.
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349⁹⁵

Use with our 10-Megabyte Disk Cartridge System. 26-1372 349.95

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Kit

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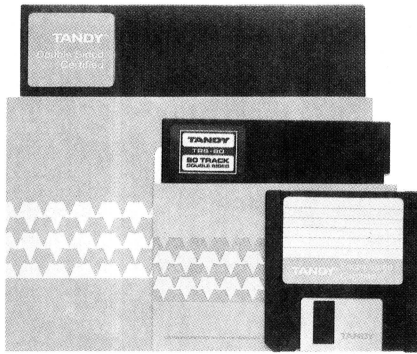


Clean clogged, recessed areas. 26-1320 34.95
Refill Fluid and Pad.
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Certified 8.9cm, 13.3cm and 20.5cm Unformatted Diskettes

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Size	Tracks	Diskettes Per Pkg.	Cat.No.	Quantity Price Per Package		
				1-4 (Each)	5-9 (Each)	10-Up (Each)
8.9cm	80	3	26-415	29.95	26.95	24.95
13.3cm	40	1	26-305	6.95	6.29	5.79
	40	3	26-405	14.95	13.59	12.59
	40	10	26-406	39.95	35.95	33.95
20.5cm	77	3	26-4904	29.95	26.95	24.95
	77	10	26-4906	99.95	89.95	84.95

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- State-of-the-Art Formulation and Lubrication
- All Diskettes Are Unformatted, Double-Density, Soft-Sector

Our diskettes are double coated with an advanced ferric oxide blend to provide maximum lubrication and resistance to diffusion. All diskettes are unformatted, double-density and soft-sectored. Always keep plenty of diskettes on hand. Stock up today.

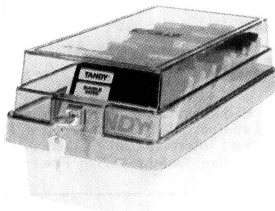
13.3cm Replacement Labels.
 26-307 Pkg. of 54/5.95
20.5cm Replacement Labels.
 26-4908 Pkg. of 50/5.95

Double-Sided Diskettes

Size	Tracks	Diskettes Per Pkg.	Cat.No.	Quantity Price Per Package		
				1-4 (Each)	5-9 (Each)	10-Up (Each)
8.9cm	80	10	26-418	99.95	89.95	84.95
13.3cm	40	3	26-411	19.95	17.29	16.49
	40	10	26-412	49.95	44.95	41.95
	80	3	26-409	39.95	35.95	33.95
	80	10	26-410	79.95	72.95	66.95
	80 (1.6Mb) High-Density	3	26-421	39.95	35.95	33.95
		10	26-422	129.95	117.95	109.95
20.5cm	77	3	26-4961	44.95	40.95	37.95
	77	10	26-4960	139.95	126.95	117.95

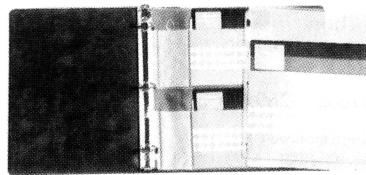
Diskette Storage Box

44⁹⁵



Organise your floppy disks with five adjustable dividers. High-impact styrene.
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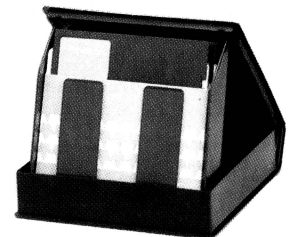
Protect Your Diskettes



Universal 3-Ring Data Binder.
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13.3cm Disk Envelopes. Holds 2 Package of 10. 26-510 15.95
20.5cm Disk Envelopes. Holds 1 Pkg. of 10. 26-4907 18.95

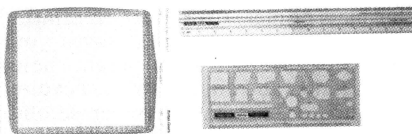
Disk Library Boxes

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Store like a book when closed, flip through disks when opened.
 8.9cm. Holds 5. 26-1380 Pkg. 2/9.95
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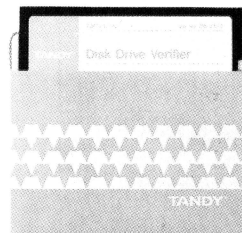
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- Model I/III Graphics Worksheets.**
 26-2105 100 Sheets/11.95
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Flowchart Template.
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69⁹⁵



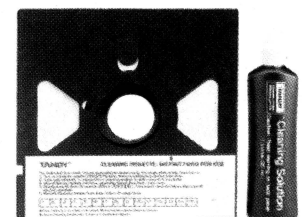
For Tandy 1000 EX and SX

Analyses alignment, rotational speed index sensor position, clamping ability and write/read accuracy. Tandy 1000 requires 256K, Tandy 1000 EX requires 384K.
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Disk Drive Head Cleaning Kits

Kits for 8.9, 13.3 and 20.5cm

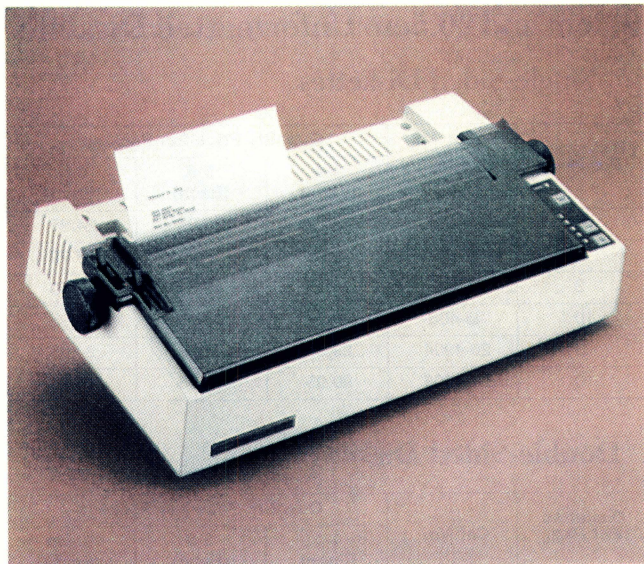
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8.9cm Kit. Single-sided. 26-419 ... 29.95
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 13.3cm Drive Kit. 26-408 29.95
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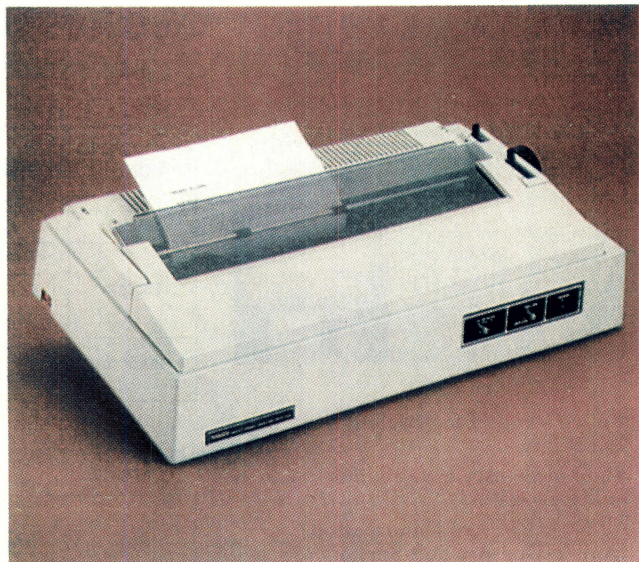
1899⁰⁰

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DWP 520. Give your correspondence, reports and memos that clean, crisp "electric typewriter" look. You can print fixed 10 or 12 characters per inch or choose proportional spacing (using appropriate optional 96-character print wheels). Prints up to 43 characters per second. Features forward and reverse paper feed and 1/2-line feed, backspace and underline. Supports boldface, strike-through, double-underline, super and subscripts. "External Program Mode" allows you to use print wheels with different pitch or special characters. Parallel interface only. Includes Courier 10 print wheel and carbon ribbon. 26-2800 1899.00

DWP 520 Bi-Directional Tractor. 26-2801 269.95

SPECIFICATIONS. Print Speed: 19.5 lpm at 10 cpi, 132 column. Carriage Motion: Uni-directional, optimal motion seeking. Character Set: 96 ASCII, plus special and international, 21 control codes. Paper: Up to 16" wide. Original, plus 5 copies. Friction feed. Interface: Parallel. Dimensions: 20.3 x 62.2 x 39.4cm. Weight: 12.7kg. Power: 240V AC, 50 Hz.



Our Lowest-Priced Daisy Wheel

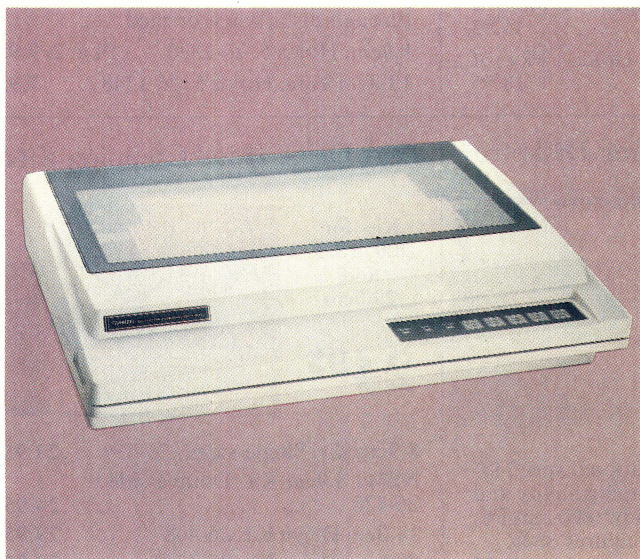
899⁰⁰

- IBM Compatible
- Prints 200 wpm

DWP 230. Now you can get full-featured letter-perfect printing for under \$900. Select 10 or 12 characters per inch, or proportional pitch. Uses interchangeable 96-character print wheels. Prints at 20 cps. Includes forward and reverse paper feed and 1/2-line feed, underline and programmable backspace. Self-test facility lets you see if printer is operating properly before starting. "Ribbon End" features stops printer when ribbon reaches its end. Automatic impact control prolongs the life of the print wheel. Parallel and Color Computer-compatible serial interfaces. Includes Courier 10 print wheel and carbon ribbon. 26-2812 899.00

DWP 230 Bi-Directional Tractor. 26-2813 199.95

SPECIFICATIONS. Carriage Motion: Bi-directional, optimal motion seeking. Character Set: 96 (modified ASCII, plus special international), 18 control codes. Paper: Up to 16" wide. Original, plus 3 copies. Friction feed. Interface: Color Computer-compatible serial and parallel. Dimensions: 16.7 x 61.9 x 30cm. Weight: 11.8kg. Power: 240V AC, 50 Hz.



Deluxe Business Printer Dot-Matrix Power for Business

2599⁰⁰

- IBM PC Compatible
- Prints 380 cps

DMP 2200. A versatile business printer. Efficient, fast printing means no long delays for reports — and that saves your business money. Supports elongated, double-high, bold, underline, super/subscripts, italics and double-strike. Features bit-image graphics. Prints up to 380 characters per second. Uses 7.6 to 40.6cm fanfold paper only (bottom or rear paper feed). Built-in tractor — not sprocket. Prints original, plus up to six copies. Parallel interface only. 26-1279 2599.00

SPECIFICATIONS. Print Density: 10, 12, 17.1 (standard); 10 and 12 (correspondence); proportional and compressed proportional. Print Speed: Standard 10 cpi—380 cps. Correspondence 10 cpi—90 cps. Proportional—77-180 cps. Character Set: 95 ASCII, 31 graphics and special characters. IBM Character Set 1 and 2. Horizontal Dot Resolution: 60-240 dots/inch, 1632-3916 dot columns/line. Dimensions: 12 x 57.1 x 42.9cm. Weight: 18.1kg. Power: 240VAC, 50 Hz. IBM, Registered TM of International Business Machines Corp.

AFFORDABLE TANDY PRINTERS

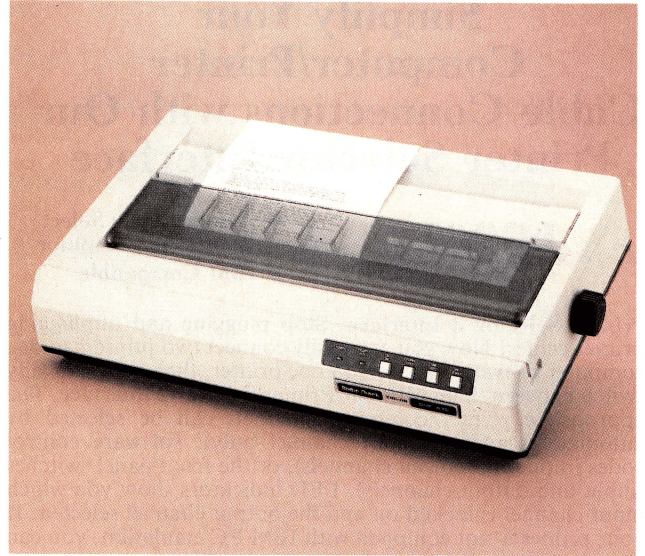
Produce Correspondence-Quality Text Using This 132-Column Printer with 18-Wire Print Head

1299⁰⁰

IBM PC Compatible

DMP-430. The 18-wire print head gives you superior-quality correspondence fonts in a single pass. Prints 10, 12 or 16.7 cpi, plus elongated standard, elite and condensed. Get micro, italic and double-high fonts, too. Produces bit-image graphics at 7 or 16-bit columns. True pin-driven tractor — not sprocket. Prints original, plus two copies, at up to 180 characters per second. Parallel and Color Computer-compatible serial interfaces. 26-12771299.00

SPECIFICATIONS. Print Density: 10, 12, 16.7 cpi, plus elongated. Print Speed: 10 cpi—43 lpm/80 col. Character Set: 96 ASCII, 64 special and 30 block graphics characters. Horizontal Dot Resolution: 480-800 dots per line. Vertical Spacing: 12, 6, 8 lines per inch. Line Feed: 1/6, 1/8, 1/12, 1/72". Dimensions: 7.9 x 39.1 x 24cm. Weight: 3.97kg. Power: 240VAC, 50 Hz.



Triple-Mode "Personal Printer"

599⁰⁰

- IBM PC Compatible
- Prints Up to 100 cps

DMP 130. Features word processing, data processing and dot-addressable graphics modes. Prints in four character styles: Standard or italic cursive in draft or correspondence modes. Supports super/subscripts, double-width, bold, double-strike and microfonts. Bi-directional, logic-seeking print head (unidirectional in correspondence and graphics modes). Prints original, plus two copies on 10.2 to 25.4cm fanfold paper or single sheets. Built-in tractor. Parallel and Color Computer-compatible serial interfaces. 26-1280599.00

SPECIFICATIONS: Print Density: Draft Quality—10, 12 and 17 cpi (standard and italic cursive). Correspondence Quality—10 and 12 cpi (standard and italic cursive). Speed: 50 to 100 cps (draft), 20 to 24 cps (correspondence). Character Set: 96 ASCII, plus Tandy or IBM special characters. Bit Image: 480 to 1920 dot columns/line. Dimensions: 12 x 39.1 x 26.7cm. Weight: 4.9kg. Power: 240VAC, 50 Hz.



Budget-Priced High-Performer

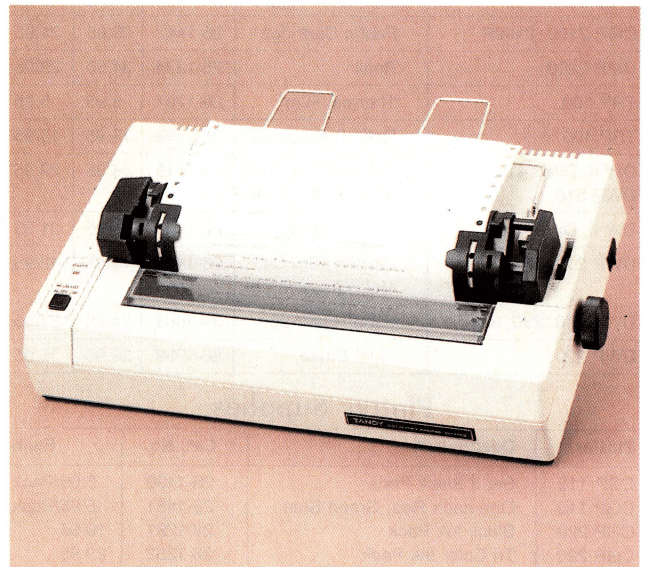
NEW FOR 87

399⁹⁵

- Bit-Image Graphics
- Prints 80 cps
- IBM Compatible

DMP 106. Another Tandy price breakthrough! Ideal for data processing and general-purpose use. Bi-directional — prints 80 upper and lower case characters per line (8 x 9 matrix) at 43 lines per minute at 10 characters per inch. Elongated and condensed modes. Prints up to 80 characters per second. Removable adjustable tractor uses 10.2 to 24cm fanfold paper, friction platen for single sheets. Prints original, plus one copy. Parallel and Color Computer-compatible serial interfaces. 26-2802399.95

SPECIFICATIONS. Print Density: 10, 12, 16.7 cpi, plus elongated. Print Speed: 10 cpi—43 lpm/80 col. Character Set: 96 ASCII, 64 special and 30 block graphics characters. Horizontal Dot Resolution: 480-800 dots per line. Vertical Spacing: 12, 6, 8 lines per inch. Line Feed: 1/6, 1/8, 1/12, 1/72". Dimensions: 7.9 x 39.1 x 24cm. Weight: 3.96kg. Power: 240VAC, 50 Hz.



There's a Tandy Store near you wherever you are.

PRINTER/COMPUTER SUPPLIES

Simplify Your Computer/Printer Cable Connections with Our Printer Selector Interface

169⁹⁵

- Automatically Select Printer or Computer
- IBM Compatible

Printer Selector 2 Interface. Stop plugging and unplugging printer cables! Now you can easily connect two printers to one computer or two computers to one printer, then automatically switch between them with our Printer Selector 2 Interface. The appropriate printer/computer channels can be selected by automatic scanning (input channel only), software control codes (input and output channels), or the front panel switches (input and output channels). LED indicators show you which input channel is locked on and the output channel selected. If your printer is not equipped with IBM PC emulation, you can change the interface's mode setting from Tandy to IBM. The Printer Selector 2 Interface is compatible with any standard parallel printer. Cables not included. 26-2820169.95



Replacement Printer Ribbons

Printer	Ribbon	Cat.No.	Each	
			1 - 11	12 up
LP III	Fabric Cartridge	26-1414	29.95	24.95
LP VI/VIII, DMP 400/420	Fabric Cartridge	26-1418	24.95	21.95
LP VII, DMP 100	Re-inking Fabric	26-1424	17.95	15.95
DMP 110	Re-inking Fabric	26-1283	19.95	16.95
DMP 130	Cartridge	26-1236	19.95	16.95
DMP 130	Refill	26-1238	34.95	29.95
DMP 500	Fabric Cartridge	26-1482	29.95	24.95
DMP 200	Fabric Cartridge	26-1483	29.95	24.95
DMP 200, 500, 430	Refill Pack (3)	26-1489	34.95	29.95
DMP 105	Fabric Cartridge	26-1288	14.95	12.95
DMP 430	Fabric Cartridge	26-1296	34.95	29.95
DMP 2100, 2100P	Fabric Cartridge	26-1442	29.95	24.95
DMP 2200	Refill	26-1234	34.95	29.95
TRP 100	Thermal Film	26-1297	6.95	5.95
TRP 100	Refill Rolls (5 pk)	26-1298	17.95	15.95
DW II, DWP 410, DWP 510	Carbon Film Cart Multi Strike (3 pk)	26-1419	34.95	29.95
DW II, DWP 410, 510	Nylon Cartridge	26-1449	24.95	21.95
DWP 210, 230, 520	Carbon Film Cart Multi Strike (3 pk)	26-1445	49.95	42.95
DWP 210, 230, 520	Fabric Cartridge	26-1458	24.95	21.95
DWP 220	Multi Strike	26-1299	39.95	35.95

Plotter Supplies

Plotter	Description	Cat. No.	Each
CGP 115	Set 3 Black Pens	26-1480	5.95/Pack
CGP 115	One each Red, Green Blue	26-1481	5.95/Pack
CGP 220	Black Ink Pack	26-1281	19.95
CGP 220	Tri Color Ink Pack	26-1282	29.95

Daisy Print Wheels Daisy Wheel II/DWP 410/510

DW II/410/510 Wheels	Cat. No.	Price
Courier, 10 Pitch	26-1430	59.95
Prestige Elite, 12 Pitch	26-1431	59.95
Madeleine PS	26-1432	59.95
Cubic PS	26-1433	59.95
Tile Italic, 10/12 Pitch	26-1434	59.95
OCR B, 10 Pitch	26-1435	69.95
Letter Gothic, 12 Pitch	26-1436	69.95
Cubic 15	26-1438	69.95
Bold PS	26-1439	69.95
Scientific A/N	26-1486	69.95
OCR/A DW2/410	26-1292	69.95

DWP 220

DWP 220 Print Wheels	Cat. No.	Price
Courier, 10 Pitch	26-1230	22.95
Letter Gothic, 12 Pitch	26-1231	22.95
Venezia PS	26-1232	22.95

DWP 230/520

DWP 230/520 Print Wheels	Cat. No.	Price
Courier 10 Pitch	26-9418	24.95
Elite 12 Pitch	26-9415	24.95
Venezia PS	26-9417	24.95
Letter Gothic PS (15 Pitch)	26-9416	24.95

Thermal Ribbon Printer

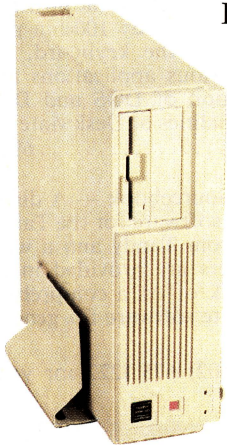
499⁰⁰



TRP 100. Prints text (50 cps) and graphics on both regular and thermal paper. Parallel and Color Computer-compatible serial interfaces. Uses AC adapter or 5 "C" batteries (not included). 26-1275499.00

COMPUTER ACCESSORIES

Universal Computer Floor Stand



NEW FOR 87

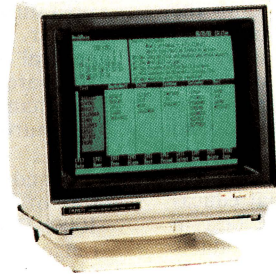
54⁹⁵

Holds CPU in Vertical Position

Computer not included

Save desk space. Place our Universal Computer Floor Stand next to your workstation. Securely holds Tandy and other PCs. Width adjusts to 15.2cm. Steel construction. Non-skid rubber feet. Easy to assemble. 26-201 54.95

Universal Monitor Pedestal



34⁹⁵

- Adjusts for Better Viewing
- Works with Most Monitors

Adjustable platform rotates and tilts for best viewing angle. Holds all Tandy monitors and many others. Color and finish of platform matches Tandy monitors. Base measures 27.9 x 26cm. 26-1369 34.95

Monitor Platform



Computer not included

NEW FOR 87

99⁹⁵

Perfect for Tandy 1000 EX

Designed to hold a monitor and disk drive for the Tandy 1000 EX. Also suitable for the Color Computer. Sturdy steel legs, wood top. 13.7 x 52.7 x 29.9cm. Easy to assemble. 26-210 . 99.95

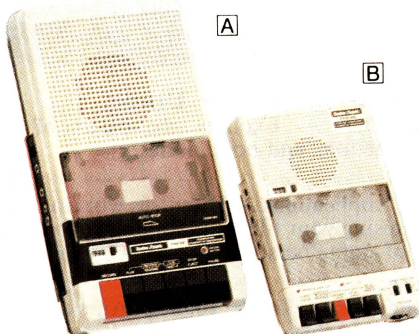
Tandy Computer Cassette Recorders

CCR-81 Recorder CCR-82 Recorder

89⁹⁵

79⁹⁵

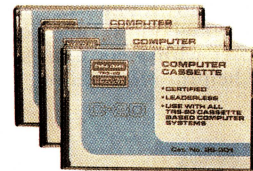
A 'Must' for Our Tape-Based Computers



A CCR-81. Ideal for loading and saving your own programs and data on cassette tapes. Battery/Record LED indicator. Includes cable. 240/V AC operation or four "C" batteries (not included). 26-1208 89.95

B CCR-82. Our smallest and lowest-priced Computer Cassette Recorder! Features volume control with preset marker. Includes cable. Requires four "AA" batteries or AC adapter (not included). 26-1209 79.95

Computer Cassettes



5⁹⁵

Quantity	C-20 (Each)
1-11	5.95
12-23	5.45
24-47	4.99
48-Up	4.79

Our certified cassettes deliver error-free data recording for tape-based computer storage systems. Each quality data storage tape is free from defects and is in a hinged plastic box for protection.

C-20 Tape. 26-301 5.95

Printer Controller Saves Time

349⁹⁵

Frees Your Computer During Printing



PTC 64 Printer Controller. Now you can print one job while working on another! The PTC 64 assumes control of all printing operations. It accepts and stores information from your computer, then feeds it to your printer as fast as the printer can handle it. This means excellent throughput and no downtime because your computer's memory, processing power and disk drives are free for other tasks. Features a clear memory function, a pause function and a copy function for printing up to 100 consecutive originals. There are even 16 redefinable special characters, as well as unique programmable functions that will give you the option of downloading an alternate operating system to generate a new ASCII character set, graphics data and more by programming the built-in Z-80 microprocessor with the host computer. Activate functions from the panel keys or through software. Standard parallel printer interface. Cable not included. AC power adapter. 26-1269 349.95

TANDY AND EDUCATION . . . NATURALLY

When it's time to select computer hardware and software, educators can look with confidence to Tandy. Since 1977, when Tandy introduced its first personal computer onto the Australian market, the full range of Tandy computers has been accepted by all levels of educational institutions. Along with providing education-specific assistance for over 350 outlets around Australia, Tandy's Education Division is committed to supporting Tandy computers and the teachers who use them. Working closely with the Education Division are specialists from Tandy's Merchandising Department and Customer Services Division. These people ensure that educational institutions are provided with the latest and best in school-based hardware and software and that these products are backed by first class service and support.

Educational Software for Varied Needs

An extensive library of educational software supports Tandy's popular classroom computers, the Tandy 1000, 1000 EX, 1000 SX and the Color Computer. The Tandy 1000's compatibility with the IBM-PC provides access to the world's leading range of MS-DOS software. This feature makes available a large number of exciting programs for students from pre-school to tertiary levels. The ability of the Tandy 1000 to run all the well-known word processing, database and spreadsheet applications also makes this the ideal computer for school administration.

The Tandy Color Computer has an impressive software base and the support of the largest number of User Groups for any computer in Australia. Computer-specific publications such as, "Australian Rainbow" and "Australian CoCo", are available through most Tandy outlets and are designed to provide the user with a constant source of new programs and a wealth of helpful information.



Tandy Teacher and Student Support

In addition to the services provided by Tandy's Education Division, training in all aspects of computing is available for teachers and students in fully-equipped Computer Centres in Sydney, Canberra, Melbourne, Brisbane, Adelaide and Perth. During special Vacation Classes, Training Instructors provide tuition in Logo, word processing and programming for children aged 8 and up. Teachers can participate in courses devoted to specific Tandy computers or master software applications designed to facilitate class management.

Tandy 1000 Support Materials

- Provided with every Tandy 1000 is "DeskMate", an integrated software package, ideal for use as a class management tool and equally useful for introducing students to the world of word processing, database management and spreadsheet analysis. With DeskMate, a school's computer investment is operational from day one, with no additional expenditure for software.

- The FUNdamentals — A Tutorial to the Tandy 1000 — A self-paced program and manual designed to teach the basics of operating computers in general, and the Tandy 1000 in particular. The user is made familiar with the keyboard, the general function of the computer, various applications and software and the concept and operation of DOS and DOS commands. The operations and potentialities of DeskMate are also introduced. 25-1167 69.95

- Tandy 1000 Educational Software Sourcebook — A directory of educational and administration software for the Tandy 1000. Details of programs available from Tandy and a wide range of educational software suppliers are provided in an easy-to-follow format. The Sourcebook offers a comprehensive guide to the selection of appropriate software for general and specialised applications.

Call Tandy's Education Division on (02) 675 1222 for your complimentary copy.



Tandy 1000 Reference Books

- Introduction to MS-DOS — Explains the basics of the MS-DOS system, its functions and possibilities. 25-1506 17.95

- Advanced MS-DOS Applications — Discusses working with files and devices, organising your files, simplifying your work, controlling the flow of data, personalising your system and more. 25-1507 24.95

- The Complete Guide to the Tandy 1000 — An extremely thorough examination of the potentialities of our most popular computer! Covers basic operations, software options, compatibility and more. 25-1505 29.95

- MS-DOS Reference Manual — Complete guide to all MS-DOS commands. 25-1501 59.95

- GW-BASIC Reference Manual — Complete reference guide to GW-BASIC commands. 25-1502 59.95

- Programmer's Reference — Documents all BIOS subroutines and entry points for use in low-level languages. 25-1503 17.95

- Technical Reference Manual — Schematic diagrams and theory of operation on the Tandy 1000 and option boards. 25-1504 49.95



TANDY'S COMMITMENT TO EDUCATION

Educational Software

Programs included in the constantly expanding library of educational software for the Tandy 1000 and the Tandy Color Computer cover a wide range of subject areas including Language Arts, Mathematics, Typing Skills, Word Processing, Adventure Games, and Desktop Publishing.

Selections from The Tandy Range of Educational Programs

- **Tandy 1000 — Learning with Leeper** — Four award-winning pre-school games designed to prepare children for reading, writing and mathematics. 25-1118 79.95



- **Tandy 1000 — Kidwriter** — Enables children to create a story book with colourful scenes, text and music. 25-1105 74.95

- **Tandy 1000 — Fraction Fever** — A program to develop an understanding of what fractions are and the relationships between them. 25-1103 74.95



- **Tandy 1000 — Wizard of Id's Wiztype** — Provides tuition in typing words, sentences and paragraphs. Choose from twenty typing levels. 25-1114 79.95



- **Tandy 1000 — King's Quest** — An exciting adventure game with three-dimensional graphics, sound and animated characters. 25-1117 89.95

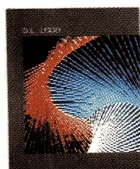
- **Tandy 1000 — Pipes** — A program to encourage logical thinking. 25-1108 54.95

- **Tandy 1000 — Pinball Construction Set** — Students can choose from 32 ready-to-use game parts to construct an electronic pinball machine. 25-1112 79.95

- **Color Computer — DeskMate** — Integrated software package incorporating the most commonly used personal productivity applications, including word processing, database management, electronic filing and more!

26-3259 139.95
DeskMate 3 — 26-3262 119.95

- **Color Computer — Color Scripsit II** — A simple word processing system in ROM cartridge format. The system includes an editor to enter and edit text and a "view" function that allows you to change the format control information while viewing the entire page. 26-3109 59.95



- **Color Computer — D.L. LOGO** — Based on the LOGO programming language. Supports 4-voice music, voice synthesizer, joysticks and more. 26-3033 199.95

Also in the range of educational software available from Tandy outlets are hundreds of programs from other suppliers. Well known programs such as The Newsroom, PrintMaster, Easy As ABC, Child Writer, Typist, Spelling Wiz and many more are available through Tandy's software sourcing agreements with specialist educational software suppliers.

Business Education

Teach your students the computer applications used by small businesses. The most popular word processing, database, spreadsheet and accounting packages are available from Tandy. With the Tandy 1000 range of computers, secondary and tertiary institutions can prepare students for the business world while introducing them to the most widely-used computer applications.

Classroom Management

With a Tandy 1000 and DeskMate, or any one of a number of excellent word processing packages, a new element of speed and efficiency will be introduced to everyday classroom management tasks. Correspondence, lesson preparation, report writing and assignments can be prepared, printed out and saved on disk for future use or adapted to suit changing needs or conditions.

The use of Desktop Publishing programs such as The Newsroom or PrintMaster can turn work sheets into "works of art" and greatly assist with student motivation.

A database program can provide teachers with ready access to student information and inventory listings including classroom libraries, teaching equipment and resource materials.

Keep track of students' progress and analyse examination results with an electronic spreadsheet.

Library Management

With the powerful Tandy 3000 HD and Hard-Disk options available for the Tandy 3000 HL and Tandy 1000 SX, schools can choose a computer to suit the needs of their library. Store hundreds, thousands or tens of thousands of records using library management packages designed specifically for MS-DOS computers.

School Administration

Streamline all facets of school administration, from simple word processing requirements to the most sophisticated record-keeping and accounting procedures. The Tandy 1000/3000 range of computers, plus a choice of the best in industry-standard business and accounting software, will ensure that your school office runs smoothly and efficiently.

Choose from the following selection of Tandy business software to facilitate management in your classroom, library or school office.

WORD PROCESSING

DeskMate supplied with every Tandy 1000
Scripsit 1000 (25-1155) 699.95
Microsoft Word (25-1153) 749.95

DATABASES

DeskMate supplied with every Tandy 1000
dBASE II (26-5352) 999.95
Friday (25-1149) 749.95

SPREADSHEET ANALYSIS

DeskMate supplied with every Tandy 1000
Microsoft Multiplan (25-1152) 399.95

INTEGRATED PACKAGES

DeskMate supplied with every Tandy 1000



pfs:Series

pfs:file (25-1140) 229.95
pfs:report (25-1141) 229.95
pfs:write (25-1142) 229.95
pfs:plan (25-1144) 229.95
Lotus 1-2-3 (25-1145) ... 1499.00

ACCOUNTING SOFTWARE

Sybiz Plus (4 modules) from 885.00 per module
Integrity (4 modules) from 615.00 per module

Many more popular titles are available through Tandy's exclusive Express Order Software Service.

NEW EXPRESS ORDER SOFTWARE

Integrity Business Software

Ascent Series*

Accounts Receivable. The easy-to-use Ascent Accounts Receivable system records the invoices and credit notes you send to customers; the amounts you receive and the journal entries you make.

Tandy 1000/2000/3000. per core 615.00

Inventory/Stock Control. The Ascent easy-to-use Inventory/Stock Control system keeps track of the inventory you have in store and when you should re-order. The system records details such as the supplier, the cost price and the sale price.

Tandy 1000/2000/3000. per core 615.00

General Ledger. The easy-to-use Ascent General Ledger records your income and expenditure to show a running profit or loss. It tells you what you own, what you owe and your company's net worth.

Tandy 1000/2000/3000. per core 615.00

Cashbook. The easy-to-use Ascent Cashbook manages your income generated from sales and your expenditure generated from expenses.

Tandy 1000/2000/3000. per core 615.00

Accounts Payable. The easy-to-use Ascent Accounts Payable system records the invoices and credit notes you receive from suppliers, and manages your cash outflow including disputed invoices and prompt payment discounts.

Tandy 1000/2000/3000. per core 615.00

Ascent Payroll. The easy-to-use Ascent Payroll system can reduce the cost, confusion and time it takes to produce pays manually.

Tandy 1000/2000/3000. Fully optioned. 840.00

Professional Time Costing. The easy-to-use Ascent Professional Time Costing records the chargeable time and expenses incurred for each job and for each client, as well as the non-chargeable time your employees spend in the office.

Tandy 1000/2000/3000. per core 615.00

*For full details, refer page 16. Horizon Series for Multi-user System. (T.B.A.)

Accounting One is designed for small businesses easy-to-use, computer size and memory depends on the number of accounts and transactions. Includes accounts receivable, invoicing, stock control, statements, financial ledgers and reports, suppliers accounts, bank account activities.

Tandy 1000/2000/3000 835.00

Payroll One is designed to suit most small and medium sized business. Detailed payslips, tax calculations, group certificates, easy to follow and illustrated help are some of the features.

Tandy 1000/3000 595.00

Support: Integrity Business Software, (for Ascent and Horizon Series, Accounting One and Payroll One.)

RETAILER

Retailer. A full featured software package designed for the small retailer such as Bookshops, Hardware Stores, Fashion, Toy Stores or for any small retailer who wishes to control inventory from point of sale. Features with or without bar coding, over counter receipting, label printing, word processing, management reports and controls, purchase order system, optional cash drawer system, daily reports. System designed to customise for each user's requirements as details of application are analysed with supplier.

Support: Computer Mart Pty. Ltd.

Tandy 1000 HD/2000/3000HD. variable

Attaché

Accounts Receivable. Slow-paying customers may be identified in summary through the aged trial balance report or in detail through the customer highlight report. Balance-forward and Open-item customer account types may be specified with the same ledger. "Passport" is included.

Hardware Requirements: 256K and two disk drives. T1000/2000/3000. 788.00

Support: Attaché Software.

General Ledger. This package is for small to medium-sized businesses, and can be used by itself or integrated with all other Attaché modules. You define all elements of the chart of accounts structure. You define the format and content of all financial statements. Financial statements may be obtained at any time. Multi-company, department, division or consolidated financial statements may be created. Includes "Passport".

Hardware Requirements: 256K and two disk drives. T1000/2000/3000. 788.00

Support: Attaché Software.

Inventory Control. May be used by itself or integrated with General Ledger and Accounts Receivable. Each item may be assigned up to three different selling prices. Inventory may be costed according to average cost, fixed cost, or decimal places for specifying fractional quantities. Includes "Passport".

Hardware Requirements: 256K and two disk drives. T1000/2000/3000. 788.00

Support: Attaché Software.

Invoicing with Sales Analysis. This is used with Accounts Receivable and Inventory. Accounts Receivable balances and inventory quantities are automatically updated. Accommodates stock items, non-stock items, and service billings. The system will display a warning message if customer's credit limit has been exceeded or sales quantity exceeds the quantity on hand. Automatically computes sales discounts and sales tax.

Hardware Requirements: 256K and two disk drives. T1000/2000/3000. 788.00

Support: Attaché Software.

Business Pak I. This package includes Accounts Receivable, Invoicing/Sales Analysis and Inventory integrated into a system. Business Pack I integrates with Business Pack II to make a fully-integrated accounting system. Comes handsomely packaged in an attractive attache case to keep as your own.

Hardware Requirements: 256K and two disk drives. T1000/2000/3000. 2100.00

Support: Attaché Software.

Business Pak II. This package includes General Ledger and Accounts Payable integrated into a system. Business Pack II integrates with Business Pack I to make a fully integrated accounting system for your business. Comes handsomely packaged in an attractive attache case to keep as your own.

Hardware Requirements: 256K and two disk drives. T1000/2000/3000. 1400.00

Support: Attaché Software.

All Attaché packages can stand alone or integrate with other packages. Features "Passport" which allows each package to integrate with most productivity tools.

Accounts Payable. It is an open-item system that maintains a file of purchase history payment details and aged outstanding balances. Partial payments may be specified for any invoice. Automatic vouchers are used to generate regular payments. "Passport" allows integration with popular productivity tools.

Hardware Requirements: 256K and two disk drives. T1000/2000/3000. 788.00

Support: Attaché Software.

MORE EXPRESS ORDER SOFTWARE

Software Suppliers

Effective Business Accounting. Best value on the market . A complete, integrated Australian accounting package which offers you the best value on the market. It includes Tutorials on Computers and Accounting to make it even easier for you to learn and use. Effective has been designed specifically for small to medium sized businesses. It offers Debtors, Invoicing, Stock, Creditors, General Ledger. Requires minimum 256K, 2 x 360K Disk Drives (preferably 1 Disk Drive plus 1 Hard Disk).

Support: Software Suppliers Pty. Ltd.

Tandy 1000/3000 675.00

System 4

System 4 is an integrated accounting system which includes the four (4) most sought after modules: Accounts Receivable; Accounts Payable; General Ledger; Invoicing. Has a novice function for first time users. A file recovery has been built in. Requires minimum 256K, 2 x 360K Disk Drives.

Tandy 1000/3000 645.00



C.P.A. + is a fully integrated accounting package that works in full complement with Lotus 1-2-3. In order to use it, you do not need to learn to use Lotus 1-2-3. Includes:

General Ledger. Use as many as 35 characters to describe each account. Up to 700 accounts available depending on computer memory. Financial and Income Statement features are what most businesses want.

Accounts Payable. At least 12 information category for each payable. Cash disbursements allow viewing payables by invoice or due dates.

Accounts Receivable. Automatic updating of the General Ledger, up to 700 companies. Automatic or selective cash receipts; Aged reports and graphs as of any date. Ability to print one statement at a time.

Employee Payroll. Automatically updates the General Ledger, the Quarter-to-Date and Year-to-Date files. Calculates taxes. Employee numbers are not required. Up to 48 employees, depending on computer memory:

Requires minimum 256K, 2 x 360K Disk Drives (preferably 1 Disk Drive plus 1 Hard Disk.)

Tandy 1000/3000 645.00

Cash Desk

Cash Desk enables you to do Bank Reconciliation; allows 999 Cash Book columns, up to 32,000 transactions per year; 52 categories of accounts; design to run multiple companies on the same system; multi-period processing; and other features.

Tandy 1000/3000 870.00

Asset Manager

Asset Manager designed for companies having a need to control company asset depreciation and tax depreciation. It can interface with Lotus 1-2-3, Symphony, Framework, and others. Includes flexible depreciation types such as: straight line, reducing balance, sum of the year digits and one year write off. Requires minimum 256K, 2 x 360K Disk Drive.

Tandy 1000/3000 1170.00

Support: Busiware/Ozi, Soft Pty Ltd. for System 4, CPA+, Cash Desk and Asset Manager.



SYBIZ PLUS is designed to handle completely the accounts of the average business. Fully integrated, but it can be purchased economically on a module by module basis. **T1000/2000/3000:**

General Ledger. Brings together all financial aspects of your operations to their focal point . . . automatically. You are therefore able to obtain a complete and up-to-date picture of your business at any time. 885.00

Debtors Ledger/Sales. Module can reduce clerical labour and improve cash flow in a matter of weeks. Once customer's details have been entered, invoices, receipts and adjustments can be posted as they occur. 885.00

Order Entry/Invoicing. Offers full control of customer order and back orders together with automatic invoice pricing, extension and printing. 380.00

Creditors Ledger/Purchasing. The modules permit accurate control of purchasing and cash outflow. They enable you to hold your funds for as long as possible, yet, at the same time, maintain your credit ratings by means of timely payments. 885.00

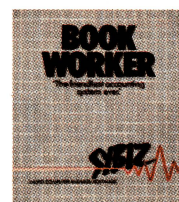
Purchase Orders. Watertight control of purchasing can be obtained. Purchase orders can be printed, amended and cancelled. Full reconciliation with deliveries and invoices is then provided. 380.00

Inventory. Computerising your stock control can save you money and improve service to customers. At all times you know exactly what is in stock and what it costs. Turnover trends are analysed to minimise stock on hand. Prices can be quickly and accurately maintained. 885.00

Job Costing. SYBIZ PLUS handles the costing of jobs from garage service work to house building. Works order numbers can be raised, costed and invoiced. Major projects can split into cost centres and control progress claims. You can constantly monitor profitability. 885.00

Sypay is an all purpose payroll system designed to maintain employee payroll files, calculate wages, deductions and tax, and print employee pay envelopes. These functions can be performed on a weekly, fortnightly or monthly basis.

Tandy 1000/2000/3000 885.00



Book Worker

Book Worker is a completely integrated accounting system for small businesses. It is designed for simplicity and ease of use — users do not have to remember complicated codes and account numbers. Easy transition from manual to computerised system.

Tandy 1000/3000 995.00

Support: All SYBIZ Plus modules, Sypay and Book Worker are by SYBIZ Software Pty. Ltd.

NEW EXPRESS ORDER SOFTWARE

Communications

Microsoft Access 1.0. A business communications program with advanced features that make on-line communications both easy and efficient. Access's Custom Menus make using commercial information services easy by being consistent across the services; you do not have to learn a new command interface each time you subscribe to another one. The "Learn" facility helps automate routine tasks. The Export feature allows transfer of information captured on line directly into other programs like Lotus 1-2-3, Multiplan, Microsoft Chart, and most word processors.540.00

Hardware Requirements: T1000/3000. 256K and telephone modem.

Support: Microsoft Pty. Ltd.

VIP Terminal. A telecommunications program that allows you to send and receive text from other computers. It also allows you to communicate with information services such as bulletin boards. It uses high resolution to display true lower-case characters and up to 85 characters per line — a real benefit for 80-column information services. It also works with VIP Writer for editing of files. Includes tape and disk versions.84.45

Hardware Requirements: 32K minimum CoCo 2 modem.

Support: Computer Hut.

Viatel

Viaterm Software has been developed in Australia for the Tandy Model 4 Computer. It has been designed to give the Model 4 user access to the world of Viatel communications supplied by Telecom. Features include: Ability to read and write frames to and from disk for later accessing; user security to prevent unauthorised use of your password and I.D.; printing capability to a line printer (graphics characters printed as an asterisk; remaining memory and out of memory indicators; ability to distinguish different columns on the screen (necessary for some information suppliers).....99.95

Recommended Hardware: 64K Model 4/4P, with 2 disk drives, RSC232C Interface, RS232C Cable, dual speed modem 1200/75.

Support: 80 Software.

CoCoTex is a Color Computer software package which will bring the new and exciting world of Videotex into your home. When used in conjunction with a 1200/75 Baud (V23) modem, it will turn your color computer into a powerful, easy to use terminal.99.95

Recommended Hardware: 64K Color Computer 2 or 3, cassette recorder, 1 cassette tape, modem.

Support: CoCoTex.

VTEX2 is a software package that will allow Tandy 1000's and Tandy 2000's to communicate with Telecom's Viatel network using an optional V2123 modem. The software has been written and developed in Australia. VTEX2 is a program for displaying Videotex data on personal computers that use MSDOS. Powerful facilities are provided for storing, searching through and processing frames of Videotex data. The software is provided with a comprehensive manual which will take the user from the ground up in the use of Viatel. Careful attention to the setup procedures is recommended. Please specify if software is for Tandy 1000 or Tandy 2000...235.00

Recommended Hardware: Minimum 128K/1 drive, V2123 Modem, RS232C Cable 26-1408, RS232C Board.

Support: Neologue Pty. Ltd.

Gateway. With Upstart/Gateway and VideoTex you can use and display information from videotex services such as Viatel. It offers sophisticated features for communication. For T1000/3000 256K minimum.....336.60

Support: Arcom Pacific

Graphics

ProDesign II. You can produce drawings that you thought were impossible to create. ProDesign II is truly the CAD system that anybody can use! The best feature of ProDesign II however, is not its low price, is not its outstanding performance, and is not its extensive hardware compatibility. The best feature of ProDesign II is its unequalled ease of use!

.....643.00

Hardware Requirement: T1000/T2000, 640K RAM 2 drives minimum, Compatible Dot Matrix Printer.

Support: Software Suppliers Pty. Ltd.

TurboCAD-Pink Software. This high performance computer aided design package has been built to put your bright ideas onto paper. Its flexibility allows you to update, change and enhance your creative ideas. TurboCAD is an exciting product which meets the accuracy and standards required by professionals. Runs with commonly used printers and plotters to give a high quality output. Dynamic Zooming, and Panning facilities enable construction of drawings that are larger than the screen. Automatic Dimensioning updates dimensions when parameters change. This can include areas as well as lengths. Accuracy within one millimetre makes highly detailed drawings possible. Version 1.32690.00

Hardware Requirements: T1000, 640K RAM.

Support: Busiware of Ozisoft Pty. Ltd.

PrintMaster Plus. Turns your personal computer into a print shop. You can create and print your own greeting cards, letterheads, calendars, signs and banners — all with your computer and dot matrix printer. PrintMaster brings out the graphic artist in you, with easy-to-use menus that let you choose from a variety of type styles, graphics, border designs and layout patterns. Choose ready-made graphics from PrintMaster's optional extra art gallery of 1200 pictures and symbols, or design your own and add them to your collection.

.....113.00

Hardware Requirements: T1000/3000. 256K and IBM compatible printer.

Support: Pencom Educational Software.

The Print Shop. Imagine printing your own personalised greeting cards, invitations, letterhead, stationery, signs and banners . . . instantly! That's only the beginning of what you can do. PRINT SHOP features 8 type-styles in multiple sizes and formats; and dozens of pictures, symbols, border designs, abstract patterns and an editor for creating your own design. Requires T1000/3000 minimum 256K 2 drives, compatible dot matrix printer.119.00

Support: Imagineering.

GEM Draw. An element-oriented graphics editor that can produce charts, diagrams, logos and drawings. The graphics library includes straight lines, rectangles, circles, polygons and arcs. Additional features include a sketch option which permits free-hand design, text (in 6 point sizes) that can be bold or italicized, 39 fill patterns, and a pre-programmed picture library. The GEM Draw package also includes the GEM Desktop release 1.2. Requires T1000/3000.509.00

Support: Arcom Pacific.

CoComax is a program for use on the Color Computer 2 to give the CoCo a much enhanced graphics ability. It is probably the most sophisticated program ever created for the CoCo, but it is simple to use. The key to its simplicity is its use of "Icons" (small symbols that you point at to get a function). Pull down menus control all other functions. CoComax allows for use with either cassette or disk versions; can be used with the multipac interface; takes advantage of the joystick, mouse or koala pad to allow for high speed and great accuracy in the use of its high resolution graphics. CoComax is supplied with a detailed operator manual. Requires 64K CoCo 2.99.95

Support: Computerware for Micros.

NEW EXPRESS ORDER SOFTWARE

Framework II

Framework II. Framework is the best productivity software available for people who need word processing, spreadsheets, database management, outlining, business graphics, and communications. Framework's outlining function provides powerful and unified management of text, spreadsheets, graphs, data bases, and ideas. Commands are consistent across all applications. Context-sensitive help is available on-line, and a powerful "undo" command allows effective error correction. Easy to learn and use for the first-time user. Integrate text material and graphics. Supports communication with mainframe computer and other data sources. Users can access DOS and run other programs without leaving Framework. Its programming language, FRED, permits the development of integrated, vertical applications. Framework has powerful micro capabilities, with keystroke recording. Framework provides a close coupling with dBase II® and dBase III®, as well as the capability to use files from Lotus 1-2-3™, WordStar®, and other standard formats. Framework also contains a rich procedural language. Plus 80,000 word spelling dictionary... 1465.00

Hardware Requirements: T1000/3000. 384K (512K using MSDOS) and two disk drives. (Hard Disk recommended.)

Symphony

Symphony. Symphony integrated software keeps pace with business managers and professionals. This management tool combines five business functions in one package. Easy-to-learn functions that can be used separately or together means you don't have to learn a new software package each time you need new capabilities. Symphony also includes a built-in programming tool, the Symphony Command Language, for users to create custom applications. Key functions include: Spreadsheet for analysis and planning; Word Processing for reports and memos; Database Manager for organising, sorting and retrieving information; Communications to access other PC's, on-line services and mainframes; Graphics to visually summarise data. 1470.00

Hardware Requirements: T1000/3000. 512K, 2 disk drives. Hard disk recommended. Color graphics and hi-resolution graphics card.

Support: Imagineering.

GEM Collection

GEM Collection. With GEM Desktop™ software you can control your computer simply by pointing with a cursor and pressing a button. The computer's screen is arranged just like a desktop, with pictures like file folders, disk drives, or a calculator. GEM Write™ lets you write and edit, move and copy, search and replace or erase and print without learning complex commands. Or use GEM Paint™ to create virtually any kind of graphic, then integrate your graphics into reports with just a push of a button. 407.00

Hardware Requirements: T1000/3000. 512K, 2 disk drives. Graphic requirements: color graphics card, graphics card and a printer.

Support: Arcom Pacific.

Microsoft®

Windows. Windows is an extension of the MS-DOS operating system and extends the 640K limit of a Personal Computer. The Windows package includes MS-DOS Executive to provide basic DOS-related functions, Appointment Calendar to keep your schedule and signal with an audible alarm, Card File to keep names and addresses, Notepad to keep time-related notes, Calculator for quick arithmetic functions, as well as Terminal — a simple telecommunications program. As an introductory offer, Windows will include the Write word processing program as well as Paint — a creative graphics program. 256.00

Hardware Requirements: T1000/3000. 256K and two disk drives or one hard disk.

Support: Microsoft.

Open Access

Open Access I. Open Access is a useful and fully integrated program that includes five different applications. Information Manager is a fully relational database that offers simultaneous access to five related databases. Spreadsheet offers both Goal Seeking and Channel Linking and operates up to four spreadsheets simultaneously. 3-D Graphics gives you multiple bar graphs on a 3D axis. Word Processor is a complete text editing and text formatting system that also includes mail-merge. Communications lets you communicate with other computers, through a choice of available modems. And Time Manager is a complete electronic calendar, appointment diary and address book. Requires modem, hi-res graphics. 880.00

T1000/2000/3000: (256K 2 Drives)

Open Access II — The Next Generation. A comprehensive set of business tools giving you a Spreadsheet, 3-D Graphics, powerful Database, Word Processing, and Communications. Also included is a complete Desk Manager which is available at a keystroke anywhere within the system and includes a calculator, appointment scheduler, electronic business card holder, and many more. 1260.00

Hardware Requirements: T1000/3000. 256K and modem. Hard disk recommended.

Support: Provided by Software Suppliers Pty. Ltd. for a nominal charge on either Open Access I & II.

Q&A 1000/3000. Q&A is the first Intelligent Database that understands your own words. Type in an English question, like "Which Eastern Region sales people have sales greater than their quotas?". Q&A automatically finds and displays the answer, then displays a report if you wish. The database is integrated with a lightning-fast word processor. Their combined capabilities handle jobs from a simple customer mailing to a complex production tracking and reporting system. Q&A is as easy to use as the pfs:file, pfs:report and pfs:write programs, but it offers enhanced functionality, like: indexing on 115 fields; 7 data types, including money, dates, hours, Y/N, text, numbers and keywords; multiple-level sorts; macros; programmability; box-drawing; laser printer support; spelling checker; and an easy-to-use mailmerge. 599.00

Hardware Requirements: T1000/3000. 512K and two disk drives or hard disk.

Support: International Solutions.



GEM Desktop 1.2

Gem Desktop 1.2. This program is an operating system interface. It changes the computer screen into a graphic representation of a desk's surface. Just "point and click" your mouse and the Desktop does the rest. Familiar icons of disks and a wastebasket appear on the screen, while file folders and documents appear in user-controlled windows. By using drop-menus, you can open or delete a file, run a program or perform other basic operating system functions. 119.99

Hardware Requirements: T1000/3000, 384K.

Support: Arcom Pacific.

NEW EXPRESS ORDER SOFTWARE

DATABASE/UTILITIES

VIP Database Color Computer. A sophisticated database program modelled after pfs:file. VIP Database allows you to see up to 85 characters per line, and it includes a math package for reports. It may be used with VIP Writer to merge forms and letters for mass mailings. 85.00

Support: Computer Hut.

Color Computer II. 32K, 1 disk drive.

filePro 16

filePro 16. An electronic filing system, data base manager and applications developer. It has all the capacity (16 million records, 4,608 characters per record) and customization features (error-checking dictionaries, conditional operations, user-definable menus) needed for large projects, while still being easy to use and to change. filePro 16 files can be transferred intact between single and multi-user computers.

Hardware Requirements: 384K and a hard disk drive.

Tandy 1000/3000. 900-0248 899.00

Tandy 2000. 256K minimum. 900-0120 799.95

dBASE III Plus

DBASE III Plus. The number-one selling database management system for personal computers. dBASE III Plus efficiently dispatches the work of day-to-day data management tasks for people who don't want to program, or becomes a programmable tool for those who prefer to program their own system. The system satisfies the needs of beginners or more experienced users alike. With our built-in Assistant, you'll be provided with new, easy-to-use pull-down menus for creating, using and modifying multiple databases. Finally, there's a new Applications Generator that rapidly creates entire applications programs. All this without any programming. Other built-in tools include improved debugging aids, assembly language calls, faster sorting and indexing and a host of other features to give you more control and flexibility. Besides stand-alone operations, dBASE III Plus has local area networking capabilities with features like password protection, field and file encryption, and record and file locking commands. 1470.00

Hardware Requirements: 384K and two disk drives.

Support: Imagineering.

Tandy 1000/3000.

Open Access II Database with User Language. A complete, powerful Relational Database Management System that allows you to enter, store and retrieve information quickly and efficiently. One of the useful tools included is "Programmer", a very high-level User Programming Language which allows you to produce customised or vertical market applications. ... 754.00

Support: Software Suppliers Pty. Ltd.

Tandy 1000/3000. 384K, 2 disk drives. Hard disk recommended.

DataFlex

DataFlex. A complete single/multiuser relational database management system that includes easy to use menu-driven file, menu and report generators as well as a powerful command language for sophisticated applications. Novice users will find it easy to get started and expert programmers will love it for its high-level capabilities. Allows over 16 million records/files, 255 fields/records, 250 files open, and 9 online multikey ISAM indexes/files. Included compiler and runtime system allows for secure programs that run like lightning on Tandy systems. Online HELP, easy data import and export to other systems, password security, multifile query without programming and many other features make this your last database purchase.

Hardware Requirements: Tandy 1000/3000. 256K minimum.

Support: International Solutions.

Development Module: Single User 1273.00
Multi User 1686.00

Runtime Module: Single User 248.00
Multi User 367.00

Microsoft Rbase. A flexible relational database management system that offers a wide range of benefits. With Rbase all data defining, editing and manipulation progresses logically, similarly to the way people think. It also lets you easily create customised data entry forms and reports. Included in Rbase are application generation capabilities, database query, database modifications, advanced report writing, flexible database modification and data entry. Also contains Application Express, a unique menu-driven system for creating complex applications with ease, and a compiler for locking down the source code in applications. 1017.00

Hardware Requirements: 256K and two disk drives.

Support: Microsoft Pty. Ltd.

Reflex. Reflex shows you patterns, relationships, and inter-relationships you didn't know were there, because they were hidden in data and numbers. After uncovering these relationships, Reflex then reveals them to you in various graphic forms, such as scatter, line, bar, stacked bar and pie charts. Reflex uses advanced windowing techniques, you can see several views on the screen at the same time — you get the entire picture — all at once, without having to switch back and forth. It requires 384K, 2 Disk T1000/3000 414.00

Support: Arcom Pacific.

UTILITIES

BACK TRACK. You need a method of backup that doesn't rely on people. Makes your computer do your backups for you! Starts by itself every time you turn on your Tandy 1000/3000. Backs up during the day when your computer is idle. Backs up new or changed files every half hour. Interval is changeable and total backup is available at any time. Fully menu driven with complete help text. Documentation included. And more! Works well with Tallgrass type backup system or a designated second hard disk. 295.00

Specifications:

Operating System: DOS 2.0 through 3.1. Backup Drive: Std. or high capacity floppy. Tallgrass PC/T® tape system. Fixed or removable hard disk. Disk emulation tapes.

Memory Requirements:

256K RAM (52K resident) if backing up to disk. 512K RAM (162K resident) if backing up to tape system. Primary Hard Disk: Internal and external fixed or removable drive.

Support: Tallgrass Technologies Australia Pty. Ltd.

Sidekick. Sidekick is instant access to six essential desktop tools. Now you can jot down thoughts or messages, make quick calculations, plan and schedule appointments, check calendar days and dates, find phone numbers, dial calls automatically and look up ASCII codes. With Sidekick, you can open interactive windows over your current application program and use any of Sidekick's tools. 155.00

Support: Arcom Pacific.

Tandy 1000/3000.

Lettrix. A superb printer enhancement program that gives your Matrix printer 20 different fonts. These include Greek outline, Russian, Hebrew, as well as double height, double width and proportional spacing, and a font design feature. It operates with just about all text producing software programs on IBM PC compatibles. 190.00

Support: Software Suppliers Pty. Ltd.

Tandy 1000/3000.

COCO-UTIL. A valuable utility program which allows you to transfer Tandy Color Computer disk files to your MS-DOS machine (Tandy 1000). You may also transfer MS-DOS files to a Color Computer disk. This great new utility will save you hours of retyping. Requires Tandy 1000, 2 Disk Drives, 128K minimum 65.95

Support: Computer Hut Software.

MORE EXPRESS ORDER SOFTWARE

Super Project

Super Project. A comprehensive project management tool that has Beginner, Intermediate, Expert and Customising Modes. Includes deadline scheduling options for projects; pull-down menus, command key functions; PERT & GANTT charts customising; planned/actual task duration comparison; 3-level sorting; displays under or over-usage of resources for multiple projects; full range of fixed, variable cost also total Planned/Actual costs for each project, task or resource; presentation quality screen/reports; accommodate data transfer with other popular application programs. 932.00

Support: Arcom Pacific.

Tandy 1000/3000 (384K, 2 disk drives or with Hard Disk).

Microsoft Project

Microsoft Project. A comprehensive management and costing system that can easily be used by both the novice and the seasoned scheduler. Use it to schedule individual projects, small group projects, or department projects. Use it to combine separate schedules into a master schedule. Microsoft Project II does time and cost calculations, and displays a graphic schedule for the project. This schedule not only shows when each activity begins and ends, but which activities need the most attention to make sure the project gets done on time. You can change information about the project and instantly see the impact to the changes. You can allocate resources and budget costs. You can also track budgeted versus actual costs by creating a Microsoft Multiplan worksheet from your project's data. 881.00

Support: Microsoft Pty. Ltd.

Tandy 1000/3000. Minimum 256K, 2 floppy disk drives or hard disk system.

Microsoft Chart

Microsoft Chart. You can create customised boardroom-quality graphics in minutes. Choose from a gallery of 45 pre-designed charts and position elements to customise your graphics — even create overlays and place multiple charts on a single page. Add color, patterns, borders, arrows and more, plus put titles, labels, legends, footnotes and other text anywhere, and in different fonts. You can link Microsoft, Multiplan, Lotus 1-2-3, dBASE and more and your charts will be built and updated automatically. You can put your charts on screen or paper, transparencies, or 35mm slides. Microsoft Chart supports a wide range of popular dot matrix printers, laser printers, plotters, film recorders, and others. 654.00

Support: Microsoft Pty. Ltd.

Tandy 1000/3000: Tandy 1000 — 384K and two disk drives.

Macro Assembler

Macro Assembler. The Microsoft Macro Assembler is a powerful assembler and program development environment for MS-DOS computers. The package includes the macro assembler, object linker, and cross-reference utility.

Support: Microsoft Pty. Ltd.

Tandy 1000/3000 (256K minimum) 449.00

PASCAL Compiler

PASCAL Compiler. Compatible with the ISO Pascal standard. It generates machine code for faster run times. Systems and applications programming are facilitated by the extensions.

Support: Microsoft Pty. Ltd.

Tandy 1000/3000 676.00

Tandy 2000. 26-5256 549.95

Fortran

FORTRAN. Includes editor, compiler, linking loader, subroutine library functions, and a listing utility. You can translate the FORTRAN source into a relocatable object code. Linker lets you load a relocatable object file and combine it with other programs.

Support: Microsoft Pty. Ltd.

Tandy 1000/3000 249.95

Tandy 2000 (26-5255) 249.95

EDUCATIONAL/TUTORIAL

Typequick — fully professional typing tutor T1000/2000

..... 87.00

Support: Aid System Pty. Ltd.

Maths Tutor Series. All programs include HELP tables, cursor and graphic aids. All allow user to create the example, or let the computer choose. Multi-level. Great teaching programs (16K Extended, CoCo 2, cassette recorder required).

Support: Computer Hut.

Long Division Tutor ... 27.95 Fractions Tutor Addition 27.95

Multiplication Tutor ... 27.95 Fractions Tutor Sub. 27.95

Factors Tutor 27.95 Fractions Tutor Multi. ... 27.95

Math Tutor. Provides a full range of math tests from Primary to High School. Ranges from single counting up to advance subjects such as square roots and exponents.

Requirements: 16K Extended, tape recorder 16.95

Support: Computer Hut.

Meteor Multiplication. Age up to 10 years. Also for remedial use. Assists in number multiplication from 0 to 9. Entertaining game format. 66.00

Support: Pencom Education Software.

Requirements: Minimum 128K Tandy 1000, optional joystick

Alligator Mix. Age up to 10 years. Also for remedial use. Assists in addition and subtraction of numbers 0 through 9 in another entertaining game format.

Support: Pencom Education Software.

Requirements: 128K Tandy 1000.

Fractions in Lowest Terms. Maths tutor for Fraction conversion. 66.00

Support: Computer Hut.

Requirements: 64K CoCo2, tape or disk drive.

CHILD Writer. Ages 9 upwards. A word processor, data base and spreadsheet. Has HELP/PROMPT/WINDOWS/EDI MENUS which can manipulate words and thoughts. ... 112.00

Support: Pencom Educational Software.

Requirements: Tandy 1000/CoCo 2, 64K plus disk drive.

MEMO Writer. Ages 12 years up. Extended version of Child Writer. Offers at least 34 brilliant features. 112.00

Support: Pencom Educational Software.

Requirements: T1000 128K/CoCo 2, 64K plus disk drive.

CHILD Speller. A spelling checker that has a facility to be used with other Word Processors including Child Writer, Memo Writer and DeskMate. 112.00

Support: Pencom Educational Software.

Requirements: T1000 128K/CoCo 2 64K plus 1 disk drive .

The Newsroom. Lets you design, produce and print out your own newspaper for your family, club, class, school or business. 112.00

Support: Pencom Educational Software.

Requirements: T1000 256K/CoCo 2 64K 1 disk drive.

TEACHERS DATABASE: This program available in disk or tape is designed to allow a teacher to keep a computerised file of information about his/her students. There are too many features to list here so please inquire for details for CoCo II minimum 32K. 55.95

For DataBase Version II with more features (disk only) 64K minimum 67.45

Support: Computer Hut.

Tandy is the World's Largest Computer Retailer



Tandy
ELECTRONICS

Tandy
COMPUTERS

Tandy
ELECTRONICS
DEALER

For over 13 years, Australia has trusted Tandy for dependability, quality and value in consumer electronics. Buy with confidence wherever you see one of these signs.

Visit your nearest Tandy Computer Centre to see our full line of computers. These centres specialise in support to business and education through fully-equipped training facilities, leasing and service plans. Most of our business computer line can also be found at any Tandy Computer Department, which is located within selected Tandy stores.

And of course, you can see our popular-priced family computers at over 350 Tandy stores and participating dealers nationwide—there's one near you.

INTERTAN AUSTRALIA LIMITED (INC. IN N.S.W.)

Diskit

Secret Diskit

Diskit 2 Plus includes an encryption function to ensure the total secrecy of your files. Operated on a 'One Key per Boot' basis, this allows a new cartridge to be booted with a cipher key encoded onto it. Without that key, the disk is useless to anyone. The data is encrypted in 64 Kbyte blocks to a standard that was set by The American National Bureau of Standards. (This is the same type of encryption method that is to become mandatory for certain Electronic Funds Transfer Systems in 1988). Of course, the removability of the disks is, in itself, a security measure unavailable to normal hard disk users.

The speed of the unit is excellent. With a track-to-track access time of 8 milliseconds, and an average access time of 90 ms, Diskit is capable of transferring data

second cartridge should the data be more than the 10.7 Mbyte capacity. Let's look at some actual times taken for file transfers.

I took a floppy at random from the large pile left scattered around by certain members of my family who don't know what a disk box is for, and ran a short test of data transfer from floppy to Diskit and Diskit to Diskit. The floppy had 356,352 bytes of data and the transfer from floppy to Diskit took 43.31 seconds. It was obvious that a high percentage of this time was for floppy access as a transfer of the same files took only 25.41 seconds between the Diskit drives. A backup from my 20 meg disk to the Diskit took 34.41 seconds and a full restoration took 32.44 seconds.

Where does the units value lie? Certainly not in the price with a potential \$8,330 for a system with two spare cartridges. You could add a further internal



at the rate of 10 Mbytes in 1 minute 24 seconds (absolute read). The formatted capacity of each of the two drives is 10.7 Mbytes with 612 cylinders, two read/write heads and a single platter. The cartridge life expectancy is quoted at 11,000 power-on hours, or about five years.

Transferring files and backing up disks is carried out as normal DOS functions or with dedicated software supplied with the unit. A fast cartridge-to-cartridge image is available for archival needs. Images of internal hard disks may be dumped to the cartridges with automatic prompting for a

hard disk for a fraction of this cost today with a bit of careful shopping. No, its value lies in its security. Many people are paranoid about data security and some even have good reason. Diskit supplies the solution to this paranoia, be it real or imagined. Encrypting the data radically shortens the odds of industrial espionage, and encrypting it and then taking it home in your pocket must almost eliminate the prospect. The cost of the unit becomes relative to the value of the data and I'm sure you could pack a lot of secrets onto a pocketful of Diskit cartridges. □

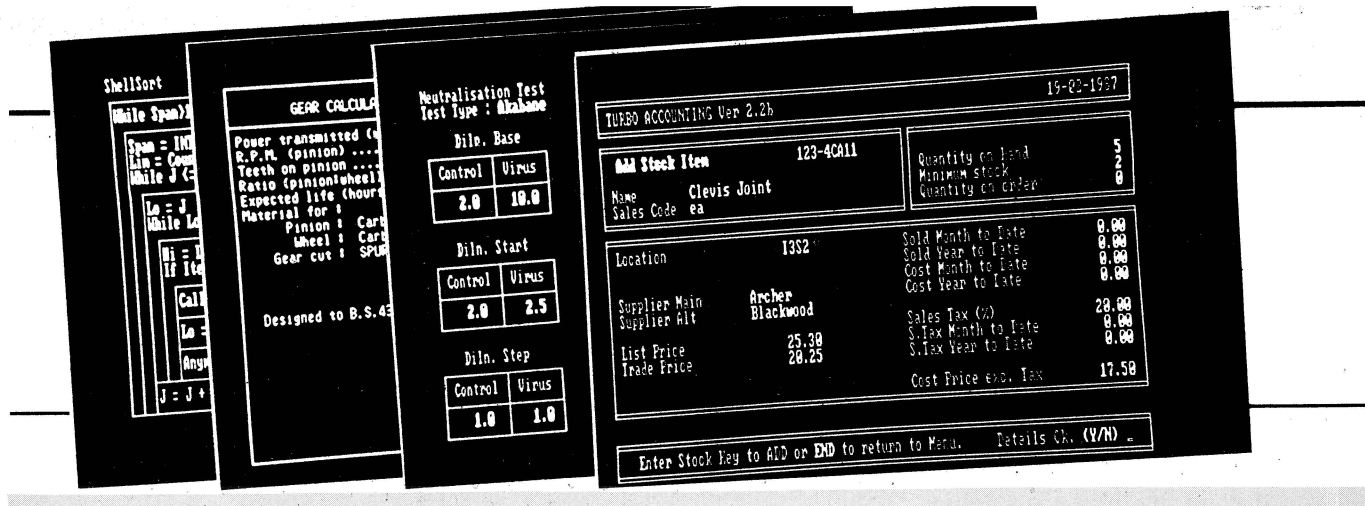
Product Details

Product:	Diskit 2 Plus
Manufacturer:	Dual 10 Mbyte Removable Cartridge Hard Disk
Review Unit From:	IDEAssociates IDEAssociates Pty Ltd, PO BOX 254 Bondi Junction, 2022 (02) 387 5222
Price:	\$6,895 without encryption \$8,330 with encryption \$772 each additional controller (no encryption) \$1,063 each additional controller (with encryption) \$300 each additional cartridge. (all prices include tax)

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If There's Nothing on the Shelf

— where do you get your software?

PETER FELDTMANN formed Feldcom Services, a computer consultancy and software writing firm in 1984; he operates from Springwood, NSW, in the Blue Mountains. Peter writes the programs, answers the phone and very largely makes his own coffee (black with three sugars — programming takes a hell of a lot out of a man).

Peter was trained in the RAAF, receiving a thorough grounding in the engineering aspects of computing as well as in programming. In idle moments, he has been known to build computers, his current tally being eight, although for professional work he prefers to use an orthodox IBM compatible.

However, his familiarity with the technical side of computing has been invaluable to him in servicing clients' hardware on-site and significantly reducing their downtime. Peter is also associated with Stylus Software, and was responsible for the PL/I translator and the help screens for Stylus ('a programmer's dream,' reviewed in YC Mar '87).

Peter's programs are highly specialised, custom-written for those whose requirements cannot be adequately met by off-the-shelf software. His recent commissions reflect the range of his clientele and their needs: an accounting and distribution program for a local milk supplier; a cipher program for a local locksmith; an invoicing package for a food distributor; a virus quantifier for a virology laboratory; a specialist spreadsheet template for a local garage; a graphics subsystem to run Turbo Pascal on a non-IBM compatible machine; and stock control and invoicing software for an aircraft manufacturer — that program, suitably modified, is now used also by a motor cycle supplier and an automotive spare parts firm. The experience gained in addressing a broad spread of

Finding off-the-shelf software is easy, but what if there's nothing on the shelf that does the job? That's the time for a computer consultant — but what exactly does he do? To find out, we asked Keith Mackay to visit consultant Peter Feldtmann . . .

computing problems in a variety of programming languages has allowed Peter to develop and refine a library of solutions.

A brief description of a project currently in hand will illustrate Peter's approach to the job. The client is an analytical laboratory whose management has decided on an upgrade of the present system. The program required is a relational database to keep track of customer records, invoicing, equipment tested and results of analyses. The project's particular difficulty lies in the number of fields which the database must deal with: a given customer file must show the usual particulars of name, address, telephone number, and so on, as well as an inventory of customers' equipment. There must be a record of tests relating to given types of samples, and input and output files relating to type of test; while a breakdown of equipment type and a history of analyses performed will form the basis of a trend analysis, which will be carried out by a separate program. In addition, the system is required to know

whether data are stored on hard disk or floppy disk, since some of the information is ephemeral and some represents constant input.

After preliminary discussions with the client, Peter has drawn up a specification of the program and sketched out its structure with the help of Stylus flow charts. When he has prepared a prototype, he will run through it with the client and any further refinements will be discussed. The program will then be completed and installed and any runtime errors will be corrected.

The program will initially be used in parallel with the existing system, and staff will be trained in its use by Peter during that period. Feldcom Services also gives a twelve-month telephone hotline service.

One of Peter's new departures is a computer evaluation course for local businesses. Too many small businessmen, Peter feels, rush into computerisation without knowing exactly what they want from a computer, without adequate technical understanding and in some cases, without even having any real need for a computer. Too many computer salesmen lack any real understanding of current software and will sell a customer a sophisticated relational database when a simpler file manager would be more appropriate; or will recommend software that is totally unsuited to the use envisaged.

The computer evaluation course seeks to put the businessman in a position where he can decide whether a computer will be useful to his business and reach an informed judgement as to the type of hardware and software he will require. The course explains what can and cannot be done with computers, and gives an introduction to DOS and the three main areas of application: word processing, spreadsheet and database management. □

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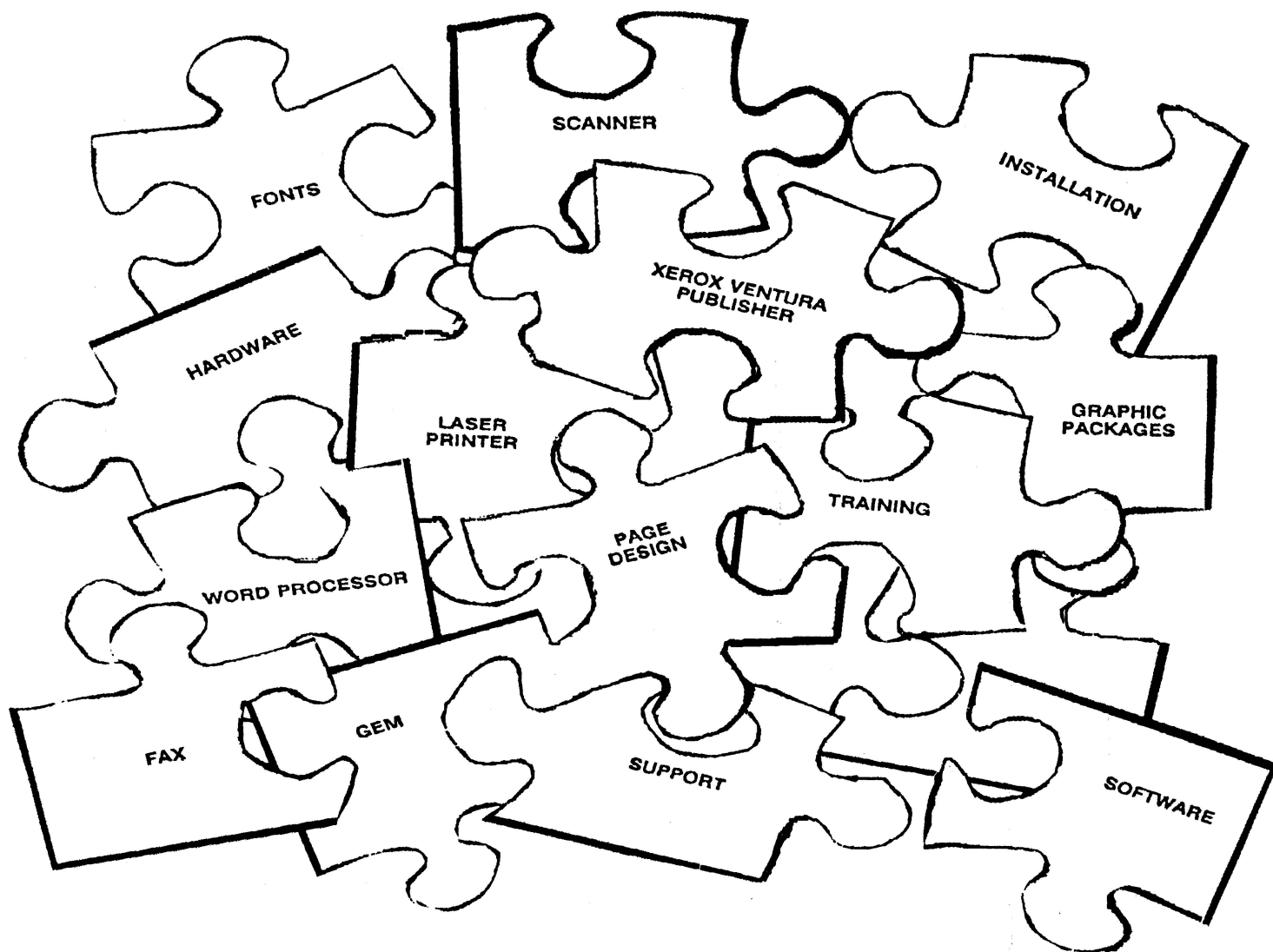
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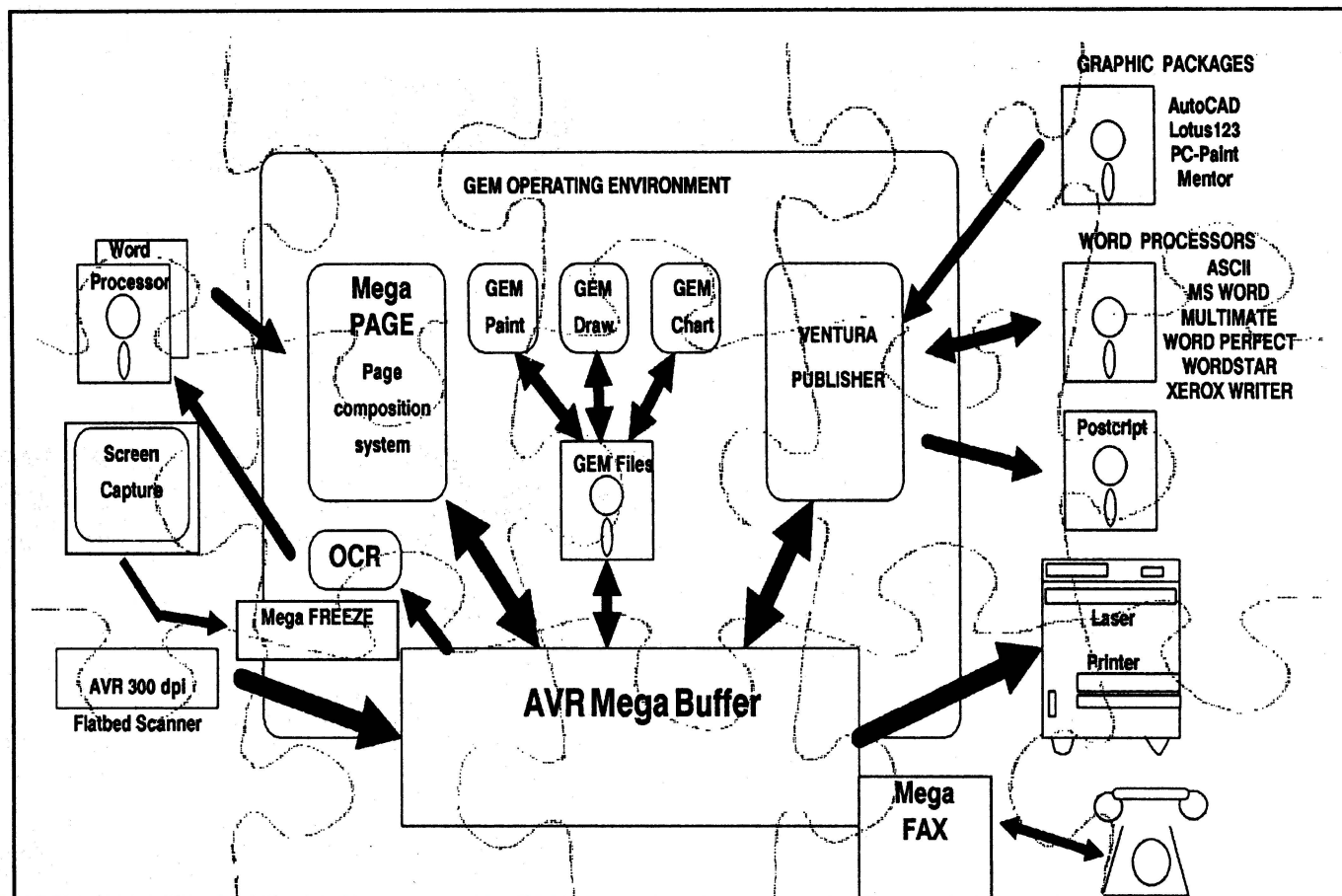
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THE VITAL F&I PACKAGE

at car finance from the inside

As the software market matures, speciality business applications, custom-tailored for the user, are starting to boom. With the vital knowledge of an insider, Ewart Stronach reports . . .

WHAT DOES F&I STAND FOR? If you are in the motor trade, it's no secret: it stands for Finance and Insurance. As one with a foot in both camps (I sell new cars when I'm not bashing a keyboard), it was second nature to me. To those of you who read these erudite words, who are also in the trade, sit up and take notice. This package is ALL SINGING AND ALL DANCING. For those of you who are going to buy a vehicle, or have ever bought one, read on, as you could well learn something.

The package is designed for use in a new or used car dealership with the object of providing information to both the seller and the buyer so that they can decide on how the purchase should be financed, how the finance and vehicle can (and should be) protected, and how to mini-

mise the amount spent on finance repayments. It works both ways. The dealer is able to penetrate his finance and after-sales market much more deeply by using a package like this one, and the client is kept far more aware of what's being paid for.

As a buyer, how many times have you watched a salesperson tapping away at a hand held calculator, poring over endless little rate cards and finally saying 'that'll

cost you \$432 a month for the rest of your life?' With this package and its clear, graphic screens, every step of the deal is openly displayed for both the vendor and the client.

The object of any motor dealer is the same as anyone else in business — maximise profit. Much of the available profit from any deal comes from what he can sell you after you have already fallen in love with that Black Beast with the Turbo-



Figure 1. A sample of a customised opening screen from Vital's F&I package for motor dealers.

charger sitting on the showroom floor. Don't be mislead by his efforts — if he is a reputable dealer, the products and finance he offers are probably the best available (all things considered), and are, at least, well worth consideration.

In the wrong hands, this package would be as dangerous as the spotty tie brigade from the wrong end of Car Yard Mile (and they don't need it!). Remember that the finance portion of any sale produces good profits for dealers, whether they're selling cars, fridges or blocks of land. If 'the dealer' can sell you finance, he will be paid a commission for the sale. Even if you elect to buy elsewhere, be certain that someone, somewhere is getting commission, be it your bank, mortgagor or credit union.

One of the fascinating applications of this program is a module which will compare the effect of paying the whole value of the car off your mortgage, and taking Hire Purchase on your new toy. Say you are a typical customer, with a mortgage of \$50,000 at 15.5 per cent over 25 years, with 18 years remaining to pay and you've laboriously saved \$15,000 to purchase a new car. You may be astounded to know that by paying that \$15,000 off your mortgage and buying the car on finance you could wind up being the staggering amount of about \$44,641 ahead of the game in interest savings and have your mortgage paid off 5.64 years earlier. These are only approximations, but few people are aware of this potential saving.

The Software

But back to the software itself. The F&I package runs best on a hard disk based IBM (or compatible, as we say in the trade), but will run in a 512 Kbyte environment with two floppies. It signs on with a graphic screen which is tailored to the dealership, offering a menu of modules which handle all facets of the proposed sale.

The first thing to be done is to enter the details of the customer and the vehicle. Note that the program will not sell cars (damn!), but takes over when you have decided to buy. Why is it that most people willingly answer questions when sitting in front of a computer screen but are hesitant if asked by someone writing the answers down. (My guess is that when someone is writing things down, you get the feeling that you are committing yourself as he writes). Once the details of the deal are entered, the program builds a series of screens, available by simple keyboard

You may be astounded to know that by paying that \$15,000 off your mortgage and buying the car on finance you could wind up being \$44,641 ahead of the game in interest savings and have your mortgage paid off 5.64 years earlier.

input of the first three letters of the required field name. If a piece of data is changed on one page, it is automatically reflected right through the subsequent screens.

The dealer has already pre-programmed a series of 'packages' into the calculations before you sit down. When the finance page is completed, you are shown how much per year, month or week your chosen jalopy will cost you. At this stage, most people fall down with shock. Times are tough in Australia and the 3 per cent

interest available in the US at the moment is all American Pie in the Sky over here. Normal Hire Purchase rates (or Chattel Mortgage as it is now known), run between 13 and 20 per cent depending on the type of vehicle, term and so on.

The program clearly shows how this is applied to your particular purchase. If the dealer has built in protection packages, these may also be displayed. The amount of After-Sales Protection is variable, but the dealer gets the opportunity to explain to you why your investment should be protected by Rustproofing, Paint protection, Fabric protection, Alarm Systems, and so on, and why you should make provision for protecting yourself from unemployment or inability to meet your payments from accident or sickness. The package allows the customer to customise his purchase, and the dealer to cover every possible avenue of after-sales sales.

Graphics

Clever use of graphic screens, accessible from any part of the suite of programs, allows the dealer to clearly display the relative fuel costs of the trade-in when compared to the new purchase. Often the monthly cost is substantially offset by available fuel savings of a magnitude most people wouldn't credit. Whilst these

COST COMPARISON OF SERVICE CONTRACTS RELATED TO PRODUCT PRICE				
	Cost	Service Contract	Percentage	Term
Television	\$ 600.00	\$ 78.95	13%	1 Year
Microwave	\$ 400.00	\$ 36.95	12%	1 Year
Washer	\$ 300.00	\$ 49.95	16%	1 Year
Dishwasher	\$ 375.00	\$ 39.95	11%	1 Year
YOUR CAR	\$10,000.00	\$ 399.00	4%	5 Year

COST OF TYPICAL CAR REPAIRS			
Repair	Cost	Extended Warranty	Term
Engine Overhaul	\$ 628.00	\$ 1147.00	\$ 1775.00
Transmission	\$ 485.00	\$ 595.00	\$ 1080.00
Air Conditioner	\$ 180.00	\$ 360.00	\$ 540.00
Power Steering	\$ 150.00	\$ 184.00	\$ 334.00

Figure 2. This very precise piece of software tailoring from the Vital package compares the cost of an extended warranty with other consumer products.

INITIAL MORTGAGE AMT.	:	95,000.00
INTEREST RATE (%)	:	13.50
TERM IN YEARS	:	25
MONTHLY PAYMENT (P+I)	:	1,107.36
YEARS REMAINING	:	17
AMOUNT OF PREPAYMENT	:	18,967.00
MORTGAGE - PRINCIPAL	:	95,000.00
- INTEREST	:	237,209.09
TOTAL PAYMENT AMOUNT	:	332,209.09
WITH PREPAYMENT	:	
SAVINGS IN INTEREST	:	48,476.88
SAVINGS IN YEARS	:	3.65
FUNCTION :	:	
CAP=	:	NUM=OFF

Figure 3. Like to pay your mortgage off 3.65 years earlier and save \$48,476.88 at the same time? That's just one of the options that can be readily explored with this specialty package.

demonstrations are obviously designed to sell you something or, at least, to gently lead to signing on the bottom line, if they are not pointed out, you could wander away from that dream machine that seems out of reach. Generally, the monthly payment is only a *reasonable* amount too large, and by showing areas of hidden savings, the program shows one way they can be met.

At any stage, the disclosure screen shows *totally* how your dollar is being spent. If you decide to minimise your monthly payment by electing not to take the proffered Rustproofing, a single key-stroke deletes it from the equation and a new set of figures is compiled. Comparisons between methods of finance such as lease or chattel mortgage, can be displayed over a wide range of terms. this allows you to make a decision which suits your budget.

From the dealer's point of view, all the information being assembled is filed for eventual print out. The program is fully modified for each dealer and a range of finance companies' rates and forms are built in. At the touch of a button, a complete finance form is printed out on the standard forms provided by the finance company. Dealers currently using the system estimate that they are saving about

20 minutes per customer with this feature.

The hidden saving for the dealer is in not having to chase a replacement signature on a legal document when the finicky finance company decides that a number is incorrect or unreadable. Any form capable of being run through a printer can be formatted. Warranty books, credit application forms, insurance proposal forms, lease documents and so on, can be arranged for any dealer. The package comes with four basic forms of the dealer's choice. These are a Hire Purchase form, a lease document, credit application and an insurance proposal. Any other form, however complex, can be made available. The graphic screens depicting the product

lines offered by the dealer are customised at no cost and greatly enhance the operation of the program. The whole program runs in full colour and retains customer attention by the bright display.

Dealer Reporting

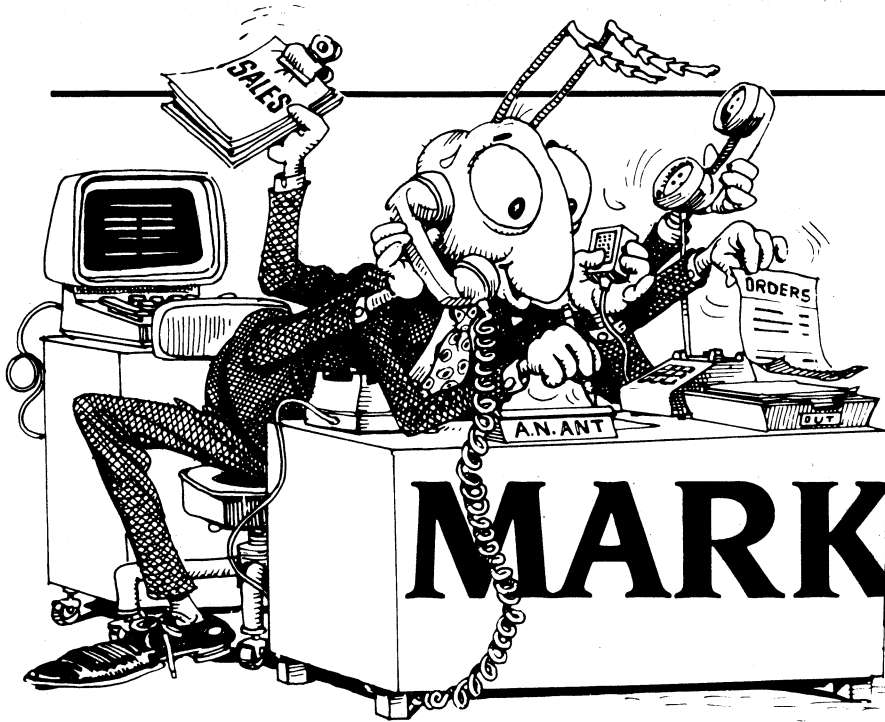
Dealer reporting is available in a myriad of styles. Each sales consultant's performance can be displayed and compared, total profit from individual deals and running totals for any nominated period are easily accessed. There is provision for additional modules which will export this data to .DIF files which can be read by Lotus 1-2-3 or Open Access type programs. Data may be merged between time structures and the whole package affords a depth of reporting which will make it a valuable analysis tool.

In my multi-faceted occupation, I have reviewed a lot of software. Seldom have I been as close to an application as I am with the Vital package. There are a number of F&I packages on the market, some with many of the features but none (to my knowledge), with all the features offered by Vital. It's ability to export data makes it versatile and free updates are offered. Modem communication for instant credit checking is a possibility when Australian finance companies wake up to the convenience of such an operation. Total costs including hardware and a printer capable of handling multi-layer forms shouldn't exceed \$10,500 — that's with top of the line hardware; selectively purchased clones would make it much cheaper.

Vital Australia is affiliated with Vital Canada — the Australian operation is autonomous, and run by an Australian with fifteen years experience in various facets of the automotive industry. The software is cleverly written, obviously modified to be specifically Australian, and support is locally available. □

Product Details

Product:	Vital F&I Package
Manufacturer:	The Vital Co, Canada
Supplier:	Vital Systems Pty Ltd, 29 Cowper St, Parramatta 2150 NSW (02) 633 5083
Price:	about \$2900 with tax (price will depend on actual configuration)
System Requirements:	IBM or compatible 512 Kbyte, with twin floppies.



PCs IN MARKETING — PART 8

In Part 7, Les Bell described the various components of a corporate management information system. This month he looks at ways to gain access to information on other machines. . .

AS WE SAW IN Part 7 (YC Feb. '87), the management information system can be a source of a large volume of useful information for marketing executives. The problem is that the system probably runs on a mainframe, while we want the information on a PC and readable into Lotus 1-2-3, Framework or a similar program.

The problem is not insoluble, however. There are two aspects to it, as with many computer-related problems: the hardware and the software. Let's look at the hardware side first.

The Hardware

I'm assuming in this case that you need to connect to an IBM mainframe; it's a fair bet, and other machines work on similar principles. Mainframes work in a very different way from PC's — they have many terminals attached, in some cases several hundred. In order to minimise the cabling, the terminals are not directly connected to the mainframe, but instead are attached to a terminal network, which in turn attaches to a channel controller which couples the terminals to the main CPU.

The most common type of terminals on IBM mainframe networks are generally known as 3270 terminals, although the 3270 itself has not been manufactured for several years. In fact, 3270 describes a family of products, and the individual components have different numbers. We

most commonly refer to terminals as being either 3278's or 3279's — the 3278 is a monochrome screen, usually without graphics capability, while the 3279 is often colour with graphics (both have since been replaced by the 3178/79).

The terminals connect via a coaxial cable to a cluster controller (3274 or similar), which typically connects up to 16 terminals to a cable which then connects, either directly or via a modem, to the mainframe. Such connections are often through a line which uses SNA, IBM's proprietary large networks system.

A 3270 network is designed primarily to handle terminal traffic: that is, the mainframe sends a screen form down to the terminal, the user fills it in, and a few characters are sent back up to the CPU, which has been doing something else in the meantime. However, 3270 links can be pressed into service for communications to PC's.

It is possible to connect a PC into the network either by connecting to the cluster controller or by connecting directly to the SNA/SDLC line which runs to the mainframe. The latter option provides highest performance, but it is also the most expensive, so most people go for the first option.

Several manufacturers provide cards which allow a PC to connect to a 3274 cluster controller and emulate a 3278/79 terminal with varying degrees of success. The earliest and best known of these cards

is the IRMA, from Digital Communications Associates. This card is supplied with software which will turn a PC into a 3270 terminal and back again.

Other manufacturers include IBM, CXI Inc, AST Research, IDEAssociates, Techland Systems and Attachmate Corp all of whose cards operate in basically the same fashion. They have two primary modes of operation: terminal emulation and file transfer, and each of these modes has further refinements.

Terminal Emulation

Terminal emulation cannot be a complete success on a PC, because its keyboard is different from that of a real 3270-type terminal. Most PC's do not have as many function keys as a 3270 terminal, nor do they have the same dedicated keys such as 'Cursor Select' and others. For this reason, the emulation software has to remap the PC keyboard and use various tricks to provide a full keyboard emulation.

In addition, various models of the 3278/79 family have screen sizes different from the PC — for example, one of them has an 80 x 43 display. This can only be emulated using an EGA (or similar) card.

The Software

Terminal emulation software falls into two categories: memory resident and fully functional. The memory-resident software is loaded into memory and remains there while other programs run, and can be activated at any time by a 'hot-key' combination. For example, the IRMA card's software is activated by pressing both SHIFT keys at the same time. When this is done, the currently running program is suspended, the screen clears, and you are now connected to the cluster controller and can proceed to establish a session with

the mainframe — and experience the unparalleled joys of CICS and other wonderful mainframe software with Stone Age user interfaces.

Press the two shift keys again, and the screen will return to your program. It is quite permissible to flick back and forth between the mainframe session and your PC-based program as you need, without terminating either. Remember to log off the mainframe before leaving, however, otherwise your system manager will come after you as a security risk.

Because the memory-resident software remains in memory permanently, it must not use up too much memory, or you won't be able to run your key software such as Lotus 1-2-3, Framework II and so on. For this reason, such software usually lacks features such as comprehensive keyboard emulation, data capture, graphics support and other things that are nice to have.

If you want to have more advanced features, you will have to use a version of the terminal emulation software which is a program in the normal sense. This means first saving files and exiting the current program, and then running the terminal emulation software.

File Transfer

You can also transfer files between your PC and the mainframe and vice versa. Once again, there are two ways to do this.

Remember, the mainframe thinks your PC is a terminal, and expects any input from it to be accepted by a program and not go to a file. It also expects the input to be ordinary text, and not a stream of bytes of arbitrary values.

The simplest way to transfer text from a PC to a mainframe file is simply to use software on the PC to transmit a text file as though it was being typed on the keyboard. At the mainframe end, the text editor is used to accept the text and save it in a file. This is crude, but effective, and is adequate for shunting text files such as reports between offices.

It has a major limitation, however, in that it can only handle text files. If you should want to transfer a spreadsheet file, which contains strange binary values, attempting to send it will give the 3270 terminal network a nasty case of indigestion.

In such cases, you must run special software which converts the unprintable binary values in the spreadsheet file into normal ASCII, or rather, EBCDIC text be-

fore sending it to the mainframe. In general, this means that each byte of the spreadsheet file will be translated into two characters of text, further slowing what may already be a very slow transmission.

When the resulting file is received at the mainframe, it is, of course, unintelligible to that computer — but then, mainframes can't run Lotus 1-2-3 spreadsheets anyway, so there's no loss. The file can, however, be downloaded to another PC and made loadable into 1-2-3 by the reverse process. The mainframe is simply being used as a gigantic mail box.

Text file transfer software often comes as standard with the 3270 card, but many have optional binary file transfer software. This is generally faster and more convenient than text file transfer, but does require the installation of matching software on the mainframe. Most binary file transfer software is restricted to running under the MVS/TSO and VM/CMS operating systems, but these are fairly common environments.

Of course, the ability to transfer a file does not imply that the transferred file can be read or used in any way by the mainframe — as I mentioned above, Lotus 1-2-3 spreadsheet files don't make sense to a mainframe. However, you will generally not be uploading data files to a mainframe; you will usually be downloading files for analysis, unless you are using the mainframe for store and forward transfer to another PC.

The simplest way to get information out of a mainframe and into a spreadsheet is to have the mainframe application produce a report — say shipments of products and then print that report to the screen of your '3270 terminal'. The '3270 terminal', being in reality a PC running emulation software, is able to capture the report in a file. You can then load the file into your spreadsheet.

You may well find that with some spreadsheets, loading a report in the form of a text file is not that easy. In particular, Lotus 1-2-3's File Import Numbers and File Import Text commands often seem to put everything in one column whereas you want it to appear in several. This problem has been addressed in various ways — for example, there is a public domain program called I23PREP.EXE which reformats downloaded reports so that they can easily be loaded into 1-2-3. Contact your local PC User Group for details.

Alternatively, check with the supplier of your mainframe software to see if they have already developed software which will automatically abstract data from a mainframe database and reformat it automatically to be loaded into PC applications. Mainframe software suppliers like MSA, Cullinet and others have developed special software which allows you to prepare a mainframe database query on the PC. After the PC checks your security privileges, it uploads the query to their mainframe software, which then produces the required summary data, downloads it and reformats it ready for reading into a spreadsheet program (usually 1-2-3).

Once you have the data in the spreadsheet, you can produce graphs and various kinds of analyses without having to know anything about mainframe languages and tools.

Expect to have to justify your request for mainframe access to your data processing manager. He is charged with ensuring the reliability and accuracy of the mainframe database, as well as providing adequate performance on his 3270 terminal network. He'll need to be sure that a) you are not going to compromise the integrity of the database by uploading information (he can stop you anyway) and b) that your activities in transferring large spreadsheets around will not slow down the network for other users (as tends to happen).

Many observers believe that the use of existing 3270-type networks to transfer data between mainframes and PC's is only a stop-gap measure, and that the real solution to this problem is the local area network. However, for the time being, we have to work with the tools available to us, and in most manufacturing and distribution organisations, 3270 networks are in place and local area networks, attached to the mainframe, are still a dream. □

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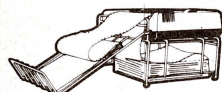
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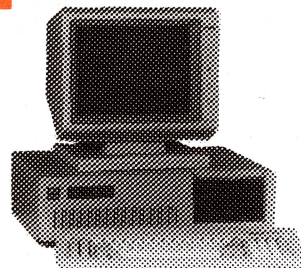


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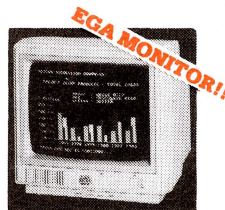
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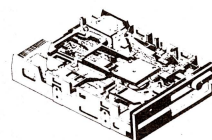
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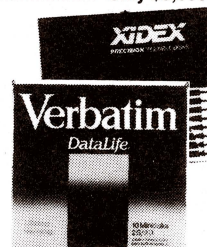
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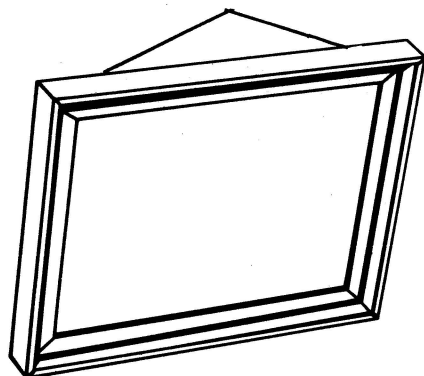
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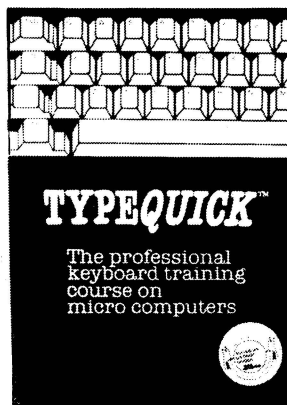
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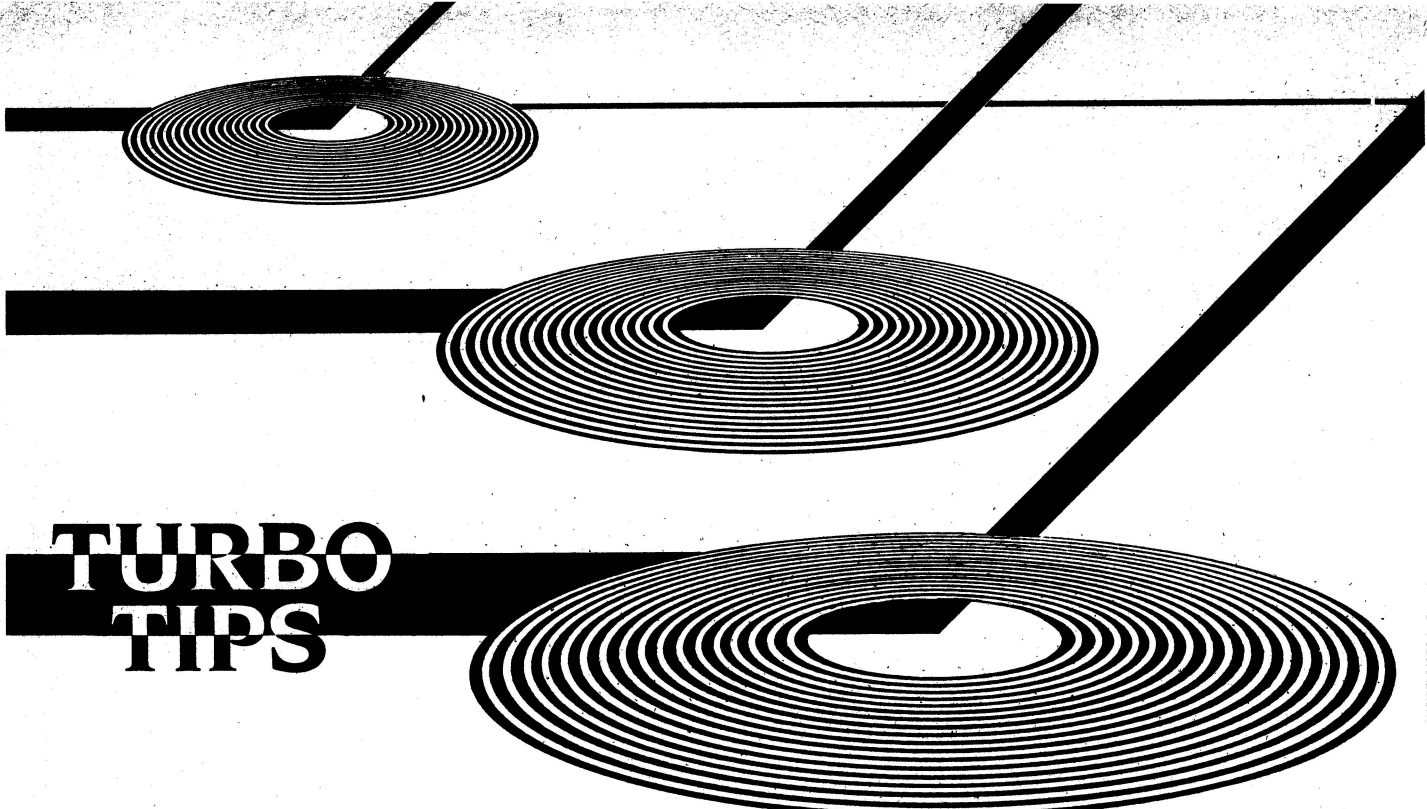
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TURBO TIPS

This month Peter Hill gives us the first of a two-part view of Turbo Pascal through windows, and shows two versions of parsing the parameters.

Parse the Parameters, Please!

RELEASE 3.00 OF Turbo Pascal provided the two Standard Functions ParamCount (an integer) and ParamStr(N) (a string) to allow the user of Turbo Pascal routines to specify certain operating parameters at the time of execution of a program. For ex-

ample, the input GO Par1 Par2 will execute the program GO with the parameters Par1 and Par2. ParamCount will return 2, and ParamStr(1) will be Par1 whilst (you guessed!) ParamStr(2) will be Par2. The second listing given below shows how to simulate these standard functions for version 2.00 of Turbo Pascal running on the IBM PC).

Of course, this does not all happen by magic; it is up to the programmer to enquire after parameters and their values and handle them appropriately. A typical situation is one where we anticipate that

the user will provide at least one and perhaps two parameters; one will be a file name and the other will comprise one or more switches to govern execution of the program. It is common to distinguish between the two by establishing a syntax that expects switches to be preceded by a minus sign: although you can specify the syntax as you wish, this is the Unix/C standard.

Hence, early in the program, we need to determine —

- a) is there an adequate supply of parameters for the task?
- b) are they syntactically correct?
- c) which parameters specify what part of the task?

If we take an example which expects a file name and possibly some switches to be set with the minus symbol preceding them, we end up with pseudo-code shown in Listing 1.

Since we are expecting only two parameters, the ELSE ought to be an error case, rather than blindly proceeding with an unexpected task. It is worth noting that, unlike argv and argc in C, Turbo Pascal does not recognise the program name as ParamStr(0), and if the program is executed without parameters, then ParamCount will be zero.

The following Turbo Pascal procedures implement the above pseudo-code for the specified case; for other cases it should be simple to adapt it.

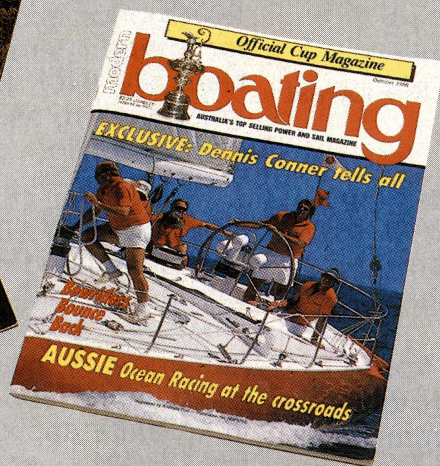
LISTING 1 -

```
Handle_Parameters;
CASE ParamCount OF
  0: Error...show proper useage.
  1: IF first character is - THEN Error...show useage
    ELSE Parameter = filename.
  2: IF neither commence with -
    OR both commence with - THEN Error...show useage
    ELSE
      BEGIN
        one is switch specification
        other is filename
        set switches
      END.
    ELSE: Error...show useage.
END.
```

Listing 1. An example of pseudo-code where the file name, and possibly the switches preceding them, are minus.

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Turbo Tips

```
PROGRAM GetParms;

TYPE
  LongStr   =STRING[255];
VAR
  Switch    :ARRAY[1..3] OF BOOLEAN;
  i         :INTEGER;
  FileName  :LongStr;

{the following include directive should only be used for
IP versions earlier than 3.00 running on the IBM PC}
(*{$IParms.inc}*)

FUNCTION UC(DummyStr :LongStr):LongStr;
VAR
  Count :INTEGER;
BEGIN
  {convert a string to all uppercase}
  FOR Count:=1 TO Length(DummyStr) DO
    DummyStr[Count]:=UpCase(DummyStr[Count]);
  UC:=DummyStr;
END;

PROCEDURE Usage;
BEGIN
  WriteLn('Usage is GETPARMS filename [-switches]');
  WriteLn('or      GETPARMS [-switches] filename');
  Halt;
END;

PROCEDURE Handle_Parameters;
VAR
  Leader :LongStr;
  PROCEDURE Set_Options;
  {determine if switches are to be set}
  BEGIN
    IF Pos('1',Leader)<>0 THEN Switch[1]:=TRUE;
    IF Pos('2',Leader)<>0 THEN Switch[2]:=TRUE;
    IF Pos('3',Leader)<>0 THEN Switch[3]:=TRUE;
  END;
BEGIN
  Leader:='';
  CASE ParamCount OF
    0:Usage;
    1:BEGIN
      IF Copy(ParamStr(1),1,1)='- ' THEN Usage
      ELSE FileName:=ParamStr(1);
    END;
    2:BEGIN
      IF (Copy(ParamStr(1),1,1)='- ') AND
        (Copy(ParamStr(2),1,1)='- ')
      THEN Usage
      ELSE
        IF (Copy(ParamStr(1),1,1)<>' ') AND
          (Copy(ParamStr(2),1,1)<>' ')
        THEN Usage
        ELSE
          IF Copy(ParamStr(1),1,1)='- ' THEN
            Leader:=UC(ParamStr(1))
          ELSE Leader:=UC(ParamStr(2));
          Set_Options;
        END;
      ELSE Usage;
    END; {Case}
  END;
END;
```

Parameters are especially important in systems software, but also have a role in applications software. The example shown here (due mainly to space limitations) replicates the type of user interface which is suitable *only* for experienced users; the interface is based on the premise that the user ought to know the syntax exactly: if not, give an error message! A much more sympathetic approach is shown as —

```
Get and analyse parameters;
IF NOT Correct_Useage THEN
BEGIN
  Show_Help;
  Full_Screen_Parameter_Input;
END.
```

Parameter passing (and parsing) can make life easier: it should never make it hard!

The Key to Windows

WIMPS (Windows, Icons, Mice and Pull-down Menus) have invaded the Personal Computer world. WIMPS are at the philosophical heart of the Apple Macintosh, and a number of operating system overlays using WIMPS such as TopView, Windows, DesQView and GEM have appeared for the IBM PC.

As well as operating system overlays, pop-up windows are appearing in applications as diverse as AppleWorks for the Apple IIe and Framework for the IBM PC. These windows are used as a user interface which is broadly consistent and draws its origins from work performed by Xerox (evidenced by the Macintosh operating system) and an extension of the Lotus 1-2-3 user interface.

A large number of software companies offer libraries (especially for C) of windowing routines of varying capability and at varying prices (as usual, there is little correlation between the two). The library routines presented here at least start off with an attractive price!

Because of its length, I've broken Windows into two parts — first, we'll explore the world of windows in Turbo Pascal on the IBM PC this month, and then, next month, we'll look at making sense of the IBM PC keyboard to prepare the ground for a fully fledged pull-down menu system.

Windows

Turbo Pascal has an elegant Standard Procedure called by Window (TLX, TLY, BRX, BRY), which establishes the specified zone on the screen as if it were the whole

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```
BEGIN {Main}
FOR i:=1 TO 3 DO Switch[i]:=FALSE;
Handle_Parameters;
FOR i:=1 TO 3 DO
    WriteLn('Setting of switch nr. ',i,' is ',Switch[i]);
END.
```

```
{
Functions ParamCount and ParamStr() for users of versions of
Turbo Pascal earlier than 3.00 running on the IBM PC; save
as Params.inc and include as shown in the main body of code.
}
```

```
FUNCTION ParamCount:INTEGER;
VAR
Arguments      :LongStr ABSOLUTE CSeg:$80;
A              :LongStr;
Count,Found    :INTEGER;
BEGIN
    IF Length(Arguments)=0 THEN ParamCount:=0 ELSE

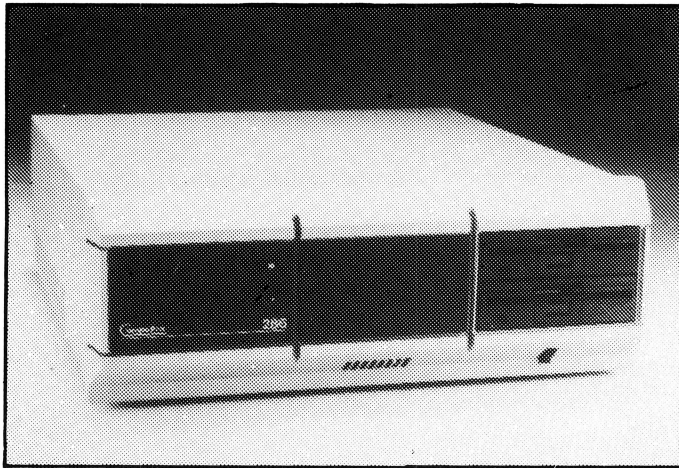
    BEGIN
        Count:=0;
        A:=Arguments;
        WHILE A[1]=' ' DO
            A:=Copy(A,2,Length(A)-1);
        IF A[1]<>^M THEN Count:=1;
        REPEAT
            Found:=Pos(' ',A);
            IF Found<>0 THEN
                BEGIN
                    Count:=Count+1;
                    A:=Copy(A,Found+1,Length(A)-Found);
                END;
            UNTIL Found=0;
            ParamCount:=Count;
        END;
    END;
END;
```

```
FUNCTION ParamStr(n :INTEGER):LongStr;
VAR
Arguments      :LongStr ABSOLUTE CSeg:$80;
A              :LongStr;
Count,Found    :INTEGER;
BEGIN
    Count:=0;
    A:=Arguments;
    REPEAT
        Found:=Pos(' ',A);
        IF Found=0 THEN Found:=Length(A);
        ParamStr:=Copy(A,1,Found);
        A:=Copy(A,Found+1,Length(A)-Found);
        Count:=Count+1;
    UNTIL Count=n;
END;
```

screen, that is, any subsequent writing to, and scrolling of, the screen will occur within that window. The Turbo Pascal distribution disk includes a demonstration

program using three 'simultaneous' windows scrolling text. Unfortunately, if you are writing commercial software, demonstration programs usually leave some-

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```

VAR
  Contents      : ARRAY[1..MaxWindows] OF ContAry;
  WindowsOpen   : INTEGER;
  IK             : CHAR;
  CGAPresent    :
  ScrnAddr      : INTEGER;

PROCEDURE WAL(Attr,C,R : Integer; CurrentStr:LongStr);
VAR
  Count,LenCurrentStr : Integer;
BEGIN
  LenCurrentStr:=Length(CurrentStr);
  C:=((R-1)*160)+((C-1)*2);
  FOR Count:=1 TO LenCurrentStr DO
  BEGIN
    Mem[ScrnAddr:C]:=Ord(CurrentStr[Count]);
    Mem[ScrnAddr:C+1]:=Attr;
    C:=C+2;
  END;
END;
PROCEDURE New_Window(Attr,ULX,ULY,LRX,LRY: INTEGER);
{
  //////////////////////////////////////
  Pass:

  Attr           :Color Attribute
  ULX,ULY,LRX,LRY :Frame Co-ordinates

  Result: A window bordered with a frame of color attrib.
  //////////////////////////////////////
}

PROCEDURE Remember_Contents;
BEGI
  Move(Mem[ScrnAddr:0],Contents[WindowsOpen][1],BytesToMove);
END;

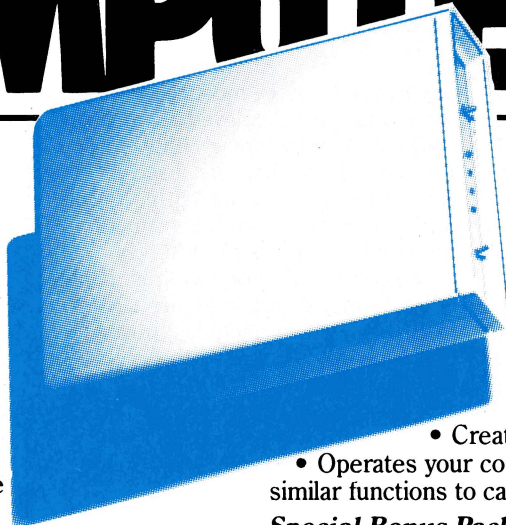
PROCEDURE Frame_Window;
VAR
  I : Integer;
BEGIN
  WAL(Attr,ULX,ULY,Chr(201));
  WAL(Attr,ULX,LRY,Chr(200));
  WAL(Attr,LRX,LRY,Chr(188));
  WAL(Attr,LRX,ULY,Chr(187));
  FOR I := (ULX + 1) to (LRX - 1) DO
  BEGIN
    WAL(Attr,I,ULY,Chr(205));
    WAL(Attr,I,LRY,Chr(205));
  END;
  FOR I := (ULY + 1) to (LRY - 1) DO
  BEGIN
    WAL(Attr,ULX,I,Chr(186));
    WAL(Attr,LRX,I,Chr(186));
  END;
END;

PROCEDURE Set_Window;
BEGIN
  Window(ULX+1,ULY+1,LRX-1,LRY-1);
  ClrScr;
  Window(1,1,80,25);
END;

BEGIN {New_Window}
  WindowsOpen:=WindowsOpen+1;
  Remember_Contents;
  Frame_Window;

```


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DOS Assistant

Confratel Computer Services have released a neat little program called DOS Assistant that gives help information about various DOS commands. This program was written by Alex McCullie as he saw the need for a program that could display the most commonly used DOS commands without going to the manual.

DOS Assistant is easy to install and the commands are very straight forward — it can be invoked by typing either HELP, in

which case 15 of the most commonly used commands are displayed in an easy to read menu, or by typing HELP <TOPIC>. The only keys that are used to move around the screens are PgDn, PgUp, Return; to exit from anywhere in the DOS Assistant, you press the ESC key.

The command information is displayed in the format shown in Figure 1. The price is \$20.00 (which includes postage and handling) for a copy of the program — from Confratel, (03) 699 8766.

Extending Your Path

Why I didn't think of it earlier, I don't know, but an obvious (now) and easy way to add new subdirectories onto your search path (at least until you switch off or reboot) is the batch file, ADDPATH.BAT —

```
PATH %PATH%;%1
```

To use it, simply give the command —

```
ADDPATH c:\fw
```

— or similar. It works by running the PATH command with the currently existing path, concatenated with the new path, as an argument.

Function Key Programming

Whenever I'm engaged in program development, I often have to invoke compiles, links and makes repeatedly. Similarly, in seminars, I find myself frequently invoking the MODE command to switch between 80 and 40 column mode. The process can be speeded up dramatically by assigning these commands to a function key, but

```
+-----+
| COMMAND: RD or RMDIR                INTERNAL |
| PURPOSE: Removes a subdirectory.      |
| EXAMPLES: 1. rd wp                   |
|           Remove the 'wp' subdirectory off the |
|           current directory.           |
|           2. rd \wp                   |
|           Remove the '\wp' subdirectory off the |
|           main directory.             |
| COMMENT: All files or other subdirectories must be |
|           deleted from a subdirectory before it can |
|           be removed.                 |
+-----+
```

Figure 1. The command information as displayed by DOS Assistant from Confratel.

being too cheap to buy SmartKey, Superkey or a utility (and too lazy to hunt for one in the public domain), I decided to write one myself.

KEY.C depends upon the fact that the ANSI.SYS device driver will allow you to reprogram the function keys by sending an escape sequence to the console device. The sequence is —

```
ESC [ KEYCODE;"string"p
```

For example, to program function key F10 with the command CHKDSK, we need to know two things: the keycode for the F10 key, and the string we'll program on it. For most keys, their keycode is the same as the ASCII character they generate, but of course, F10 does not generate an ASCII character. For such keys, the keycode is actually two characters: a null (0) followed by some other code. For F10, the sequence is 0;68.

In order to get the CHKDSK command to act immediately, we need to put a carriage return at the end of the string; however, in this position, we often cannot directly type a carriage return as it will terminate the current command (PROMPT, for example), so we must supply its keycode (13). The whole escape sequence is, therefore —

```
ESC [ 0 ; 68 ; "CHKDSK" ; 13 p
```

A convenient way to send this to the console is by using the PROMPT command —

```
PROMPT $e[0;68;"CHKDSK";13o$ps$g
```

The \$p\$g at the end simply ensures that a regular prompt will appear.

For more frequent and easy use, it would be nice to use a program to perform the task. You cannot use BASICA, because BASICA PRINT statements output directly to the screen hardware, bypassing ANSI.SYS. KEY.C is a C program which allows you to reprogram the function keys from the command line, with the syntax —

```
key -nn command line
```

Or —

```
key -rnn command line
```

For example, to program F10 with CHKDSK —

```
key -r10 CHKDSK
```

— or to put a PRINT command on F8 —

```
key -8 PRINT
```

This will program F8 with the word PRINT followed by a space.

Something to While the Nights Away

As winter approaches and the beaches empty, you might be looking for a project to while away the winter evenings. Now that pi has been calculated to a zillion decimal places and the result found to be essentially useless, there are very few challenges left in the world of computing. To fill our idle moments, we can generate

Sierpinski curves, subsets of the Mandelbrot set, fractals, solve the Four Colour Theorem and generate expert systems of plausible power.

Although, there are still a few problems left, and more will doubtless be found. I came across one the other day, in Douglas Hofstadter's *Metamagical Themas*, in the form of pangrams.

A pangram is a self-descriptive sentence of the form 'This sentence contains two a's, one b, three c's, ...' and so on. The first pangram discovered, by Rudy Kousbroek and Sarah Hart, was in Dutch —

Dit pangram bevat vijf a's, twee b's, twee c's, drie d's, zevenveertig e's, vijf f's, vier g's, twee h's, vijftien i's, vier j's, een k, twee l's, twee m's, zeventien n's, een o, twee p's, een q, zeven r's, vierentwintig s's, zestien t's, een u, elf v's, acht w's, een x, een y en zes z's.

Fascinated by this sentence, electronic engineer Lee Sallows built a special pangram engine using dedicated logic rather than a processor and software. Processing one million sentences per second, it took

```
#include "stdio.h"

#define TRUE 1
#define FALSE 0

main(argc,argv)
int argc;
char **argv;
{
    char string[255];
    int i,fkey,cr=FALSE,c;

    if(argc < 3 && argv[1][0] != '?' || argv[1][0] != '-') {
        printf("\nkey programming utility.");
        printf("\n(C) 1986 Les Bell and Associates Pty Ltd");
        printf("\nUsage: key -[r]nn string\n");
        exit(1);
    }

    i = 1;
    if(argv[1][i] == 'r') {
        cr = TRUE;
        i++;
    }

    fkey = atoi(argv[1]+i);
    for(i = 2; *string = '\0'; i < argc; i++) {
        strcat(string,argv[i]);
        strcat(string," ");
    }

    setfkey(fkey,string,cr);
}

setfkey(fkey,s,cr)
int fkey;
char *s;
int cr;
{
    printf("\033[0;%d;\"%s\"%s",58+fkey,s,cr ? "":13p" : "p");
}
```

Listing 1. KEY.C:

thirty-one days to come up with —

This pangram tallies five a's, one b, one c, two d's, twenty-eight e's, eight f's, six g's, eight h's, thirteen i's, one j, one k, three l's, two m's, eighteen n's, fifteen o's, two p's, one q, seven r's, twenty-five s's, twenty-two t's, four u's, four v's, nine w's, two x's, four y's, and one z.

Following this effort, Sallows wagered 10 guilders that no-one could come up with a computer-generated self proving sentence of the form 'This computer-generated pangram contains...', or a proof that one does not exist, within the next 10 years. That was five years ago, and I don't recall reading anywhere of the generation of such a sentence. If you want to try it, be prepared to do without your PC for quite some time! (Sallows also stipulates: no supercomputers and no parallel processors).

So, if you want to soak up some of your excess computer power...

Metacomp-based compiler to optimise an entire program without any memory limitations (conventional compilers can only fit part of the syntax tree in memory at any time).

Once the syntax trees have been generated, they are then transformed through several intermediate languages, including the tree form, a linearised code form and both three-address and two-address forms.

The resulting C86 Plus compiler, generated using MetaComp, is approximately 26% faster than Microsoft C V4.00 (according to CI). They offer the benchmark tests in Figure 2 as evidence. The new compiler has a function library compatible with Unix System V Release 2, provides new type modifiers which are consistent with the proposed ANSI standard for C (const and volatile), and is compatible with Microsoft C.

grade from Concurrent 4.1 to Version 5.0, alias Concurrent XM. Incidentally, it's amazing how many people do not register their software and consequently miss out on free or low-cost upgrades — and then bitch and complain about bugs and missing features on their old software!

Never one to look a gift horse in the mouth, I immediately returned my order, and a few weeks later the package arrived. And I'm glad it did, because XM is a major improvement over the previous version.

The major improvement is the provision of support for Expanded Memory; either the Lotus/Intel/Microsoft standard as used in the Intel Above Board or, preferably, the Ashton-Tate/Quadram/AST standard. XM uses banks of memory to bypass the 640 Kbyte memory limitation of the conventional PC/MS-DOS architecture, thus allowing the user to run multiple large programs at one time.

Many deficiencies have now been fixed up. Input/output redirection now works (though no pipes, yet) and even supports forks. Batch files are comprehensively supported with IF, FOR, ECHO and other statements, although tricks like accessing environment variables from within batch files do not work (*damn!*).

Performance is not bad, at all. Running the Norton SI program under Concurrent gave a performance index of 1.0, which indicates no degradation compared to DOS (although SI is a bit suspect — its results are often at variance with my own benchmarks).

Standard DOS commands such as SET, CHKDSK and others are supported with equivalents and even enhancements — for example, TREE gives the total size of the files in subdirectories (very useful when you're trying to make room) and even acts as a WHEREIS command. The PROMPT command now works, so that PROMPT \$p\$g will show the current directory path — something I couldn't live without.

I ran a variety of programs under it with no problems at all: dBASE, Framework, Lotus, WordStar and others ran fine, even with PYTHON playing the Liberty Bell March at the same time in another virtual console.

In summary, Concurrent DOS XM is much more usable than its predecessors. If you are looking for a multi-tasking, real-time operating system which can run up to 256 tasks at once, and can support three users simultaneously on a PC, it's certainly worth a look. □

	C86 Plus	Microsoft C V 4.00	Lattice C V 3.1	C86 V2.3
=====	=====	=====	=====	=====
RSIEVE.C	8.8	11.9	17.3	33.6
FLOAT.C	8.8	9.6	10.3	10.3
OPTIMIZE.C	35.8	38.8	15.4	45.9
LOOP.C	0.2	177.3	202.3	202.3

Figure 2. The new C86 Plus compiler, generated using MetaComp, is claimed to be 26% faster than Microsoft C V4.00.

Local Boy Makes Good

In *Choosing a Few of our Favourite Cs*, YC Jan '87, I reviewed six C compilers, looking at their performance in a number of areas such as code size, compile time and speed of generated code. One of the compilers mentioned was Computer Innovations Optimising C86, which is the one which I have used for a number of years, but — it turned in a lacklustre performance when compared with some of the newer compilers with their advanced optimisation techniques.

Now, CI has released the latest version of the compiler, which is actually an extensive rewrite of the product. In fact, CI has gone right back to fundamentals and written a new compiler-compiler called Metacomp, which extends yacc-style generation of lexical analysers to also generate the code generator phase of the compiler.

The key to the unique operation of Metacomp is the fact that it uses several stages to perform different kinds of optimisations, and each is written in CI's proprietary Tree Transformation Language (TTL) which is derived from LISP. Using a virtual memory scheme, this allows a

Of particular interest to Australian readers who may have a preference for Australian products is the fact that the designer of this compiler and founder of Computer Innovations, George Eberhardt, is Australian: born in Brisbane and educated at the University of Queensland.

With Clyde Smith-Stubbs, author of *Hi Tech C*, also resident in the deep north, it seems that the other states are falling behind in the C compiler stakes. Why should Queenslanders be such prolific compiler writers? Is there nothing else to do at nights up there?

Finally, while mentioning individuals involved in compiler writing and optimisation, if you want to read up on optimisation techniques, I would refer you to the paper *A Unified Approach to Global Program Optimization*, Conf. Rec. ACM Symp. on Principles of Programming Languages, Boston MA (October 1973) pp 194-206. The author of this seminal work is Gary Kildall, who a few months later took up operating system design by writing CP/M.

Concurrent PC DOS XM

I recently received, from Digital Research in the US, the offer of an inexpensive up-

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Rapid Screen Output with PC-DOS

— *programming the IBM Video Adaptors in Text Mode*

Why does PC-DOS have to take so long to output to the screen? It doesn't! Using Turbo Pascal, Ron Lyth has developed these techniques for the rapid display of text screens and windows under PC-DOS (the concepts are applicable to most programming environments which provide a good machine interface).

THE GOAL OF A commercial programmer writing software for the IBM PC family and its clones should be to provide an intuitive and fast user interface. Unfortunately, standard screen output provided by PC-DOS is too slow by far for most applications, so I spent a lot of time, effort and cash, finding a better way of doing things.

The commonly used video adaptors are the IBM Monochrome Graphics Adaptor (MGA) with text only display; the Hercules monochrome graphics adaptor which offers text and high resolution mono graphics, but, while the text mode is compatible with the MGA, the high resolution parameters are

incompatible with IBM standards; the IBM Colour Graphics Adaptor (CGA) with a text mode that has 16 foreground and 8 background colours and a graphics mode offering a resolution of 320 x 200 and two palettes of four colours or a resolution of 640 x 200 with monochrome; and the IBM Extended Graphics Adaptor (EGA) which supports MGA and CGA standards and has powerful additional graphics modes.

All of these adaptors support the IBM extended ASCII character set, and only those characters are used within the programs.

Within the two main video types, the MGA and CGA, communication between software and video hardware is performed through I/O ports located within the section of RAM where DOS is loaded. (For the actual addresses and their functions refer to the PC XT Technical Reference Manual or Peter Norton's *Programmer's Guide to the IBM PC*). Actual text information is passed into RAM located on the video card and begins at address B000:0 Hex for the MGA and B800:0 Hex for the CGA.

The type of display to be used is determined by setting the mode. These are the possible mode values for text displays on MGA and CGA —

- 0: 40 columns x 25 rows of text with 16 grey shades (CGA);
- 1: 40 x 25 text with 16 foreground and 8 background colours (CGA);
- 2: 80 x 25 text with 16 grey shades (CGA);
- 3: 80 x 25 text with 16 foreground and 8 background colours (CGA); and
- 7: 80 x 25 text, monochrome (MGA).

Within both systems, a text-page screen occupies 4 Kbyte (for 80 columns and 25 rows) or 2 Kbyte (40 x 25), of RAM and each character is represented by a pair of

bytes, the first of which is the character itself in extended ASCII, while the second is the attribute byte.

There is a range of BIOS services provided for video display use, and these are called extensively by DOS. If you've ever wondered why DOS takes so long to output to the screen, consider the following sequence of events that must be enacted for each character output (and that includes spaces)

- 1) The character must be loaded into the high byte of a 2-byte variable;
- 2) The current attribute must be loaded into the low byte;
- 3) The system waits for a horizontal retrace;
- 4) The 2-byte variable is moved into the appropriate location of video RAM;
- 5) The cursor position is updated;
- 6) The cursor display is updated;
- 7) The next character position is updated; and,
- 8) If the character was in column 80 (or 40) of row 25, the screen must be scrolled.

It is not entirely unexpected that programmers have by-passed this tedious approach.

Substantial time can be saved by assembling pages complete with attribute bytes elsewhere in RAM and then copying them directly into video RAM; this is the technique I've used. But, before developing it more fully, there are a couple of matters which must be dealt with.

The attribute byte plays a central role and must be explained. In a nutshell, this byte contains the colour information for both the background and foreground colours, with the high order 4-bits, or nibble, coding the background and the low order



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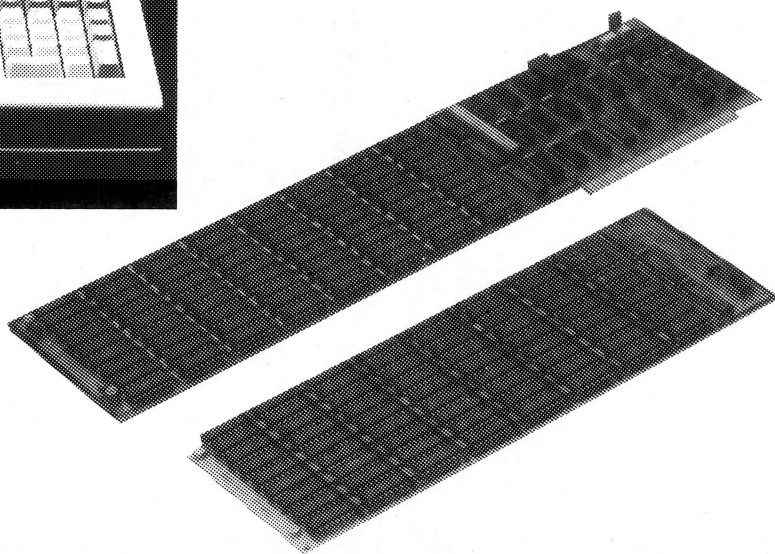
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nibble coding the foreground.

In colour mode, the 3 low order bits of each group code for the colour, while the high order bit of the background nibble codes for blink, and the high order bit of the foreground nibble codes for high intensity.

A lot depends on the type of monitor being used. Both the IBM Mono adaptor and the Hercules card, require a TTL Monochrome monitor. This type of monitor may also be connected to a CGA, and will give an adequate representation of different colours as different shades of grey. A variety of different colour monitors are used with the CGA — I found that my old KAGA Vision 2 gives better performance than the Vision 3 or 4 because its resolution is poorer and it blurs the horizontal lines together into a solid colour block.

Many users have gone for a low cost composite monitor which is plugged into a composite colour output (RCA plug) on the CGA card. These monitors frequently encounter problems when colour signals are output, especially if high intensity text is in use. The answer to this particular problem is to limit the output to these monitors to only black (colour value 0) and white (value 7).

The EGA is used only with a high resolution colour monitor and emulates, among others, the CGA text modes, so no special action is required if this board is being used.

When writing a program, I design my screen layouts first, noting carefully the location of fields for data entry. I then design the screens using ESCRENS, an excellent package available from the Public Domain, and save them as binary bsave files with the same name but different extensions beginning with 001.

The individual screens are loaded sequentially into one large file with 4 Kbyte allowed for each screen. I have written a colour installation program which takes this screen file and sets every second byte to the appropriate value for the desired colour. (I happen to like light cyan on blue, so the attribute byte in that case is 1B hex.)

Once the attribute bytes have been set, the next step is to run the program. During the initialisation, the screen file is read into a data structure of 4 Kbyte blocks which are referred to by an array of pointers, and the display of a new screen is done by moving the whole 4 Kbyte in one

SCREEN ROUTINES

```
type
  screenshot    = array[1..4096] of byte;
  scrnptr       = ^heapscrn;
  heapscrn      = record
                    screenimage:screenshot;
                  end;

var
  screen:array[0..10] of scrnptr;
  videopageseg:integer;
  { = B000 Hex for MGA or B800 Hex for CGA }
  videopage:^integer;

Code to load screen data structure:

begin
  assign(outfile,'PROGRAM.SCR');
  reset(outfile);
  for i:=1 to numscr do
    { numscr is number of screens }
    begin
      new(screen[i]);
      blockread(outfile,screen[i]^screenimage,32);
    end;
  close(outfile);
end;
```

To display a screen insert the following line of code in your program:

```
move(screen[num]^screenimage,videopage^,4096);
```

where num is the screen number you want.

HELP ROUTINES

```
type
  helpline= array[1..128] of byte;
  winptr   = ^heapwin;
  heapwin  = record
                    helppage : array[1..12] of helpline;
                  end;

var
  help :array[0..9] of winptr;
  inptr,lineptr:^helpline;
  videopageseg:integer;
  videopage:^integer;
```

Code to display a helpwindow:

```
procedure helpwindow(winno,ulc,ulr:integer);
var
  i:integer;
  inptr:^integer;
begin
  move(videopage^,screen[0]^screenimage,4096);
  for i:=1 to 12 do
    begin
      inptr:=ptr(videopageseg,(ulr-1)*160+
                    (ulc-1)*2+(i-1)*160);
      move(help[winno]^helppage[i],inptr^,128);
    end;
end;
```

Rapid Screen Output

Code to load the help page structure:

```
begin
  assign(outfile,'PROGRAM.HLP');
  reset(outfile);
  for i:=0 to numhelp do
    {numhelp is number of help screens}
    begin
      new(help[i]);
      blockread(outfile,help[i]^helppage,12);
    end;
  close(outfile);
end;
```

To display a help page this line of code should be added to your program:

```
helpwindow(num,leftcol,startrow);
```

where num is the number of the help window you want, and the x and y co-ordinates of the upper left corner are leftcol and startrow respectively.

(If you are still with me, you may have wondered where the screen[0] in the helpwindow comes from. This object is also created during initialisation - the idea is to save the current screen before displaying the help window, and then to restore the screen, and get rid of the help window, by using the following line of code:

```
move(screen[0]^screenimage,videopage^,4096);
```

slab into video RAM.

On most CGA's this gives rise to 'snow', but the techniques to avoid that are slow the program considerably, so I have chosen to ignore them. The problem is that the video RAM is being read by the video display circuitry at the same time as the display is being altered. If you wait until the pause in the read during a video retrace, you can move bytes without snow, but only 2 bytes can be moved during a horizontal retrace and 128 bytes during a vertical retrace.

I use this program to handle Help screens in commercial programs. I have standardised on a 64 x 12 display (which comes to 1.5 Kbyte with attribute bytes) and move a line at a time into video RAM. This requires a little more effort because you need to set pointers to both the beginning of each line in video RAM, and to the beginning of the line in the data structure, before you are ready to perform the move.

Turbo Pascal was used to develop the routines given here to display screens and help pages (*quickly*).

I really enjoy writing 'this stuff' — I hope my efforts will encourage you to try out your own ideas. (If you've got any ideas, tips or questions to pass along, write to me care of YC — I'll either reply personally or in a future article.) □

Some Notes on Pointers

SEVERAL high-level programming languages allow programmers to use pointers to data items, rather than refer to the items directly. Probably the richest pointer environment is C, but the facilities provided with Turbo Pascal V 3.01 give the programmer very easy access to all of memory.

In PC-DOS, every location in memory is addressed by a 2-part address comprising a segment and an offset. Each part of this address is represented by an unsigned binary integer so that a full address occupies 4 bytes. It is this 4-byte address that is referred to as a pointer. To illustrate (and elucidate) —

```
var
  anything :anytype;
  i,j      :integer;
  anypointer:pointer to anytype;
begin
  i:=Seg(anything);
  j:=Ofs(anything);
  anypointer:=Ptr(i,j);
```

What have we done? The standard Turbo Pascal functions Seg() and Ofs() re-

turn the segment and offset of the variable named within the parentheses and the function Ptr converts these 2-byte integers into 4-byte pointers. The final result is that the variable *anypointer* has been assigned the address of the variable *anything*. Now, if we wish to assign a particular value to *anything* there are two possibilities; we can either use the assignment statement as in —

```
anything:=value;
```

or we can use —

```
anypointer^:=value;
```

This second statement uses the caret character which has two meanings in Turbo Pascal. When the character appears in front of a variable name (as in *^anything*), it means the pointer or address of the variable *anything*, but if it appears after a pointer variable (as in *anypointer^*) it means the object pointed to. This means that in the above line of code,

the variable *value* would be stored in memory at the address indicated by *anypointer*.

Pointers have distinct advantages in many cases, but there are traps. The biggest trap is that it is possible to use pointers to violate the strong type-casting of Turbo Pascal.

Now, in this code —

```
var
  array2 :array[1..2]of char;
  i,j,k  :integer;
  a_ptr  :pointer to integer;
begin
  j:=Seg(array2);
  k:=Ofs(array2);
  a_ptr:=Ptr(j,k);
  a_ptr^:=i;
end;
```

— the first 2 lines set the scene for the linking of a pointer to *array[1..2] of char* to point to an integer, and the last line stores an integer in that space. Used with care this type of activity is very powerful (even if Niklaus Wirth would disapprove) — but *be warned!* □

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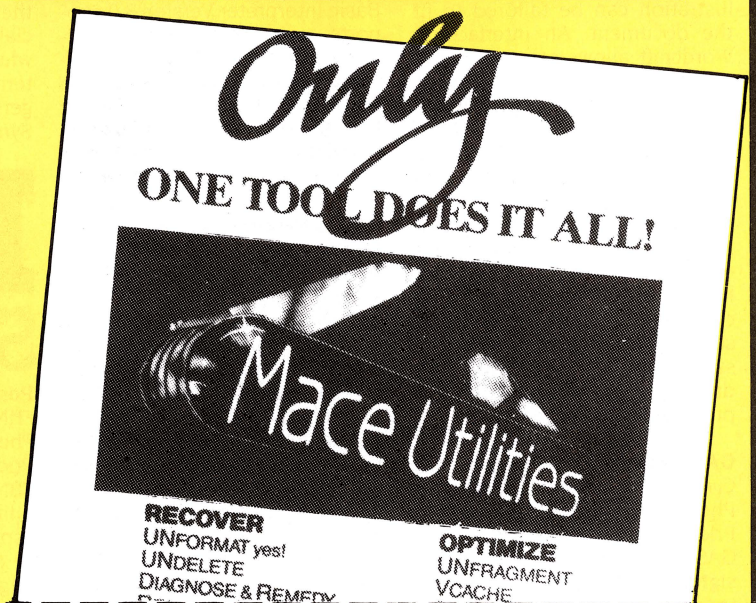
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Software

A New Image Imagemaster

Personal Computer Software

Phone: (02) 923 2899

Price: \$888 taxed Imagemaster

\$1539 taxed Elite package

The Personal Computer Software company, has announced their latest in scanning technology, with the added advantage of integrated text editing if you take the Elite package (includes Wordcraft). The software is the product of a collaboration between Wordcraft International and Canon UK. It allows images to be edited using the graphics editing, rotate, fold, copy, zoom, scale and image-merge. The illustration can be tailored to fit the document. An interface to Wordcraft allows selected pages of text to be displayed showing the final layout of the printed page with text and drawing. Editing is mouse driven and has pull-down menus. The scanner can give resolution of 200 and 300 dots per square inch (which makes it suitable for output to a dot matrix printer or a high resolution laser printer), producing camera ready material. Like most scanning techniques, the best results are obtained with line drawings — photo scanning still produces a hatched effect.

GAS Accounting Package

ComOps

Phone: (02) 498 5233

Price: \$25,000 base price

GAS is a software package designed for the accounting industry covering job costing, controlling fixed assets and history and service. The job costing module evolved from an earlier program designed specifically for the construction industry — it applies stringent control of costs in a wide variety of activities. The Fixed Assets module is a totally new creation seeking greater flexibility in controlling fixed assets of any description. It undertakes multiple depreciations employing user-specific methods and without restriction on the number of methods applied to each asset. A history module has been found necessary when transferring details about one contract to another contract with

the history file serving as a reference.

Microsoft Basic

Compiler, Interpreter, Fortran

Microsoft

Phone: (02) 452 5088

Price: \$395 Compiler

\$195 Interpreter

\$575 Fortran (all plus tax)

The Microsoft Basic Compiler for Apple Macintosh is designed to complement Microsoft's existing basic interpreter for the Macintosh range. Key features of the compiler include block IF/THEN-/ELSE/END IF statements and the elimination of iterative looping. Support is also given for hierarchical file structures which allows applications to access files within folders. Microsoft Basic Interpreter Version 3.0 supports many of the features offered with the new compiler. Microsoft Fortran Compiler Version 2.2 has received many changes with the new version supporting hierarchical file structures and the Macintosh Plus hardware.

Mystic Pascal Compiler

Microway

Phone: (03) 555 4554

Price: not supplied

For those IBM PC owners out there, Microway has come up with its own integrated multi-tasking programming package. Combining editing, compiling, program testing and debugging functions, all in the one package, the Mystic Compiler ensures the pattern of program development is maintained. Mystic can compile all of the Pascal source files and also allows Pascal statements to be keyed in, instantly compiled and executed at the global level. Compilation runs in the background with Mystic allowing the user to edit or perform other functions at the same time. The editing function provides a feature where only edited lines are compiled, in effect reducing time on re-compiling.

T-Debug PLUS

Microway

Phone: (03) 555 4544

Price: \$182 taxed

For users of Turbo Pascal, there is a new version debugger for the IBM PC range. The program appears ideal for beginners as well as accomplished programmers. It

helps beginners understand how Pascal statements work while eliminating those hard to find bugs which are every programmers' nightmare. Programmers who use any of the graphics options of Turbo Pascal have a debug option and Pascal source code can be displayed with the current instruction highlighted. Variables can be examined and changed using the symbolic names in the programs and any part of the program code can be viewed while debugging. For those into split screens (and not split personalities), the T-Debug PLUS displays source code on one side of the screen while the other half displays the debugging commands and responses. For experienced programmers there are such features as a special MAP file generation mode which is fully compatible with external assembly language debuggers such as Periscope, Atron, Symdeb.

FBN

Software

PostCode

FBN Software

Phone: (062) 86 1102

Price: \$49 taxed

FBN Software have come up with a little gem of a helpful product especially for those secretaries or office personnel looking at a huge mailing list. The PostCode is a pop-up program which provides 12,000 postcodes throughout Australia and of course their place names. The natty feature of the program is its ability to be accessed while in your word processing file and indicated postcodes can even be sent directly to the letter. PostCode consists of a small resident program which lurks in the computer's memory and an expansion file on disk containing the 12,000 locality names and their postcodes — about 50 per cent more than what is in the standard postcode booklet. A window displaying a small section of the file pops-up on the screen at the press of a key. The cursor control moves a

window through the file or the name of the destination can be entered to fine the correct ode. The postcode can be sent easily as though it had been typed in direct. Users who need to update the program as new places are created can create the additions to their copy as need be.

ProChart Business Graphics Software

Altos Computer Systems

Phone: (02) 922 2811

Price: not supplied

Altos have marched into the world of business software with the release of the ProChart graphics package. The software allows users to create line, bar, text, pie, scatter, step and combination charts for use in business presentations. Charts may contain multiple fonts and can be output in colour hardcopy onto assorted media. For beginners the package offers around 300 pages of online help, five preview levels, and a full-range of customisation capabilities allowing you to modify each chart.

R:Base 5000

SNS Computer Systems

Phone: (02) 958 2399

Price: \$2465 plus tax

The SNS Group has released R:Base 5000 for the CTOS/BTOS operating environments. R:Base 5000 contains all the features of the MS-DOS Version 3.2 but offers more speed and ease of use plus a multi-user environment, limited only by the number of users on the system. Other features include Applications Express, which is said to allow the speedy development of applications under the package, automatic menu generator, macro files, a compile facility, a data locking feature and a password security on all files. (For a look at sister version, see Peter Hills' review of R:Base System V in this issue.)

Solid Vision 3D

Datamatic

Phone: (02) 888 1788

Price: not supplied

For those graphic artists who are hunting around for 3D modeling, CalComp has come out with Solid Vision (*no, it's not a fixed stare*): a cad software package designed for the IBM PC. It is a

Dac Easy Accounting

(THE AWARD WINNER)

\$245⁰⁰*

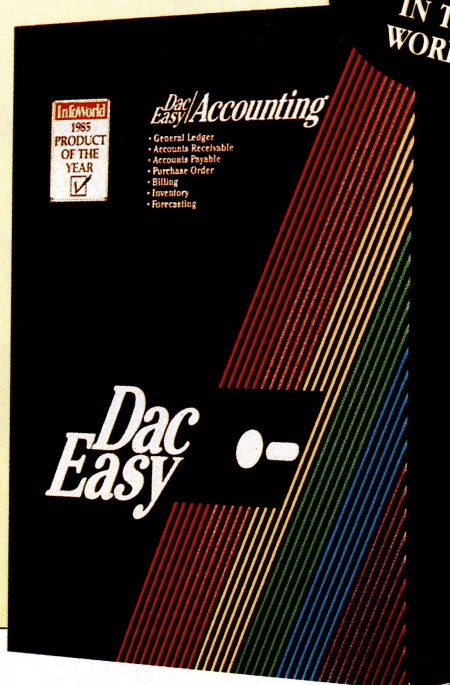
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General Information

- Menu driven
- Password protection
- File capacity limited only by disk space
- Support contract availability

General Ledger

- Unlimited # of accounts with multi-level accounting, unlimited departments
- 3 Year account history for CRT inquiry
- Pencil & pen feature to correct mistakes without reverse entries
- Unique budgeting routine (see Forecasting)
- CRT transaction inquiry, unlimited journals
- Activity report, trial balance, financial statements, etc.

Accounts Receivable

- Open invoice or balance forward
- 7 Customized columns for aging report
- Unlimited # of customers
- Mailing labels and directories with 4 different sorts
- Automatic finance charges
- Supports partial payments
- 3 Year customer history for # of invoices, sales, costs, and profits
- Customized text on statements
- Cash flow analysis
- Sales analysis
- Automatic sales forecasting by customer, salesperson or customer type

Accounts Payable

- Cheque printing and up to 10 invoices paid per cheque
- Automatic allocation of available cash to payables
- Vendor directories with sorting by vendor code, name, or territory
- Aging reports with 7 customized columns
- Unlimited # of vendors
- Mailing labels with 4 different sorts
- 3 Year vendor history for CRT inquiry and printing
- Flexible payment calendar
- Automatic forecasting of purchases
- Unlimited allocations per invoice

Inventory

- Supports average, last purchase, and standard costing methods
- Powerful physical inventory routines
- Accepts any unit of measure like fractions/dozens/gross/hours/minutes, etc.
- Automatic changing of costing methods
- Time and product inventory
- 3 Year product history in units, dollars, cost, and profits
- Automatic forecast of product sales
- Automatic pricing assignments
- Alert and activity reports with 11 sorts
- CRT shows on-hand/on-order/committed/sales/cost/profit/turns/GROI

Purchase Order

- Usable for inventory and non-inventory items
- Allows up to 99 lines per purchase order
- Per line discount in %
- Purchase Order accepts generic discounts/freight/taxes/insurance
- Purchase Order accepts back orders & returns
- Purchase journal
- Automatic interfacing with General Ledger, Payables, and Inventory

Billing

- Invoicing on plain or pre-printed forms
- Prints sales journal
- Automatic updating of committed products in inventory
- Ability to customize invoice for remarks
- Allows return credit memo
- Interfaces with Inventory, Accounts Receivable and General Ledger

Forecasting

- Unique program that automatically forecasts using your 3 year history
- Forecast revenue and expense accounts
- Forecast vendor purchases
- Forecast customer sales, cost, and profit by customer or salesperson
- Forecast inventory item usage by 4 automatic methods
- Forecast by same as last year, or % base from last year, or trend, or line analysis method

Minimum Hardware Requirements:
IBM (PCjr, PC, XT or AT) or other compatibles. 128K memory, one 5 1/4 DSD floppy disk, 132 column printer or 80 column printer in compressed mode, 80X24 CRT, MS-DOS¹ PC DOS² 2.0 or later.
¹ Trademarks of International Business Machines. ² Trademark of Microsoft Corporation.

SOME OTHER GREAT WINNERS!

Dac Easy Word \$145

With Dac Easy Word you get a system that is so simple anyone can quickly learn to type and print a wide variety of documents, but you also get power... Mail merge, searches, windowing, dictionary, multiple justifications and much more.

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Pop Up the tool you need at the touch of a key! Full desk top utilities, financial calculator, word processor, pop up D.O.S., modem, daily diary, names, address, etc.

Dac Base \$145

A powerful, versatile relational database programme with many advanced features! Can read and convert d Base II files, can run existing d Base II programmes.

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Dac Easy Word Dac Easy Base Pop Up
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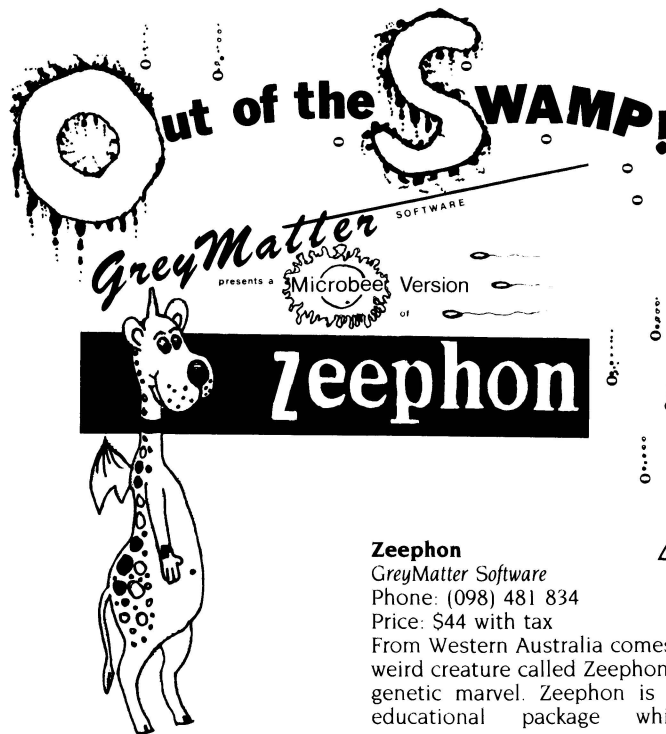
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30-Day Money Back Guarantee: MACE-SOFTWARE provides a 30-DAY MONEY BACK GUARANTEE that all claims and features listed in this ad are true.

NEW PRODUCTS

standalone, true 3D modeling package which delves into the world of realistic walls, holes, cylinders and wedges. It works on an objective-orientated database, updating information in the three dimensions. Solid Vision allows the designer to easily view the object from various angles, plan, elevation and perspective. Colour can be studied with shading and shadowing. The package uses Boundary Representation and Boolean Technology. All co-ordinated data is stored in floating point format providing six digits of numerical accuracy. It will perform wire frames, hidden line removals and determine the exact nature of complex geometric intersections. Screen and tablet menus are completely user definable as are the key board and text fonts. An intelligent database allows users to attach the extract text from any object in the drawing



Zeephon

GreyMatter Software

Phone: (098) 481 834

Price: \$44 with tax

From Western Australia comes a weird creature called Zeephon, a genetic marvel. Zeephon is an educational package which

dives into the mystic world of genetics. The program has three levels, starting with fundamental genetic terminology and a simulation of a cell division. It then goes on to demonstrate the dominance and recessiveness of genes and the production of sex cells. It builds up to advanced genetic terminology and a look at the probability of genetic events. The best thing about the program is that you get to create your own little genetic experiment. (Bit of a shame it's not real).

New Machines

Qume's QVT 101 Plus Terminal

STC

Phone: (02) 925 7272

Price: not supplied

BACK₄UP

ESSENTIAL DATA DUPLICATOR

Back up your copy-protected disks with **ESSENTIAL Data Duplicator 4 PLUS** ■

EDD 4 PLUS is new technology, not just 'another' copy program. The **EDD 4**

PLUS program uses a specially designed hardware card which works with your disk drives to back up disks by accurately copying the bits of data from each track. Don't be fooled... no other copy-program/system for Apples can do this! ■ In

addition to backing up disks, **EDD 4 PLUS** includes several useful utilities such as examining disk drives, certifying disks, displaying drive speed rpm's, plus more!

■ **EDD 4 PLUS** runs on Apple II, II Plus (including most compatibles), and IIe, and is priced at \$190.00 (duodisk/unidisk 5.25 owners must add \$32.00 for a special cable adapter). ■ A standard

EDD 4 version which doesn't include any hardware is available, and can be used on Apple IIc and III (using emulations mode) and is priced at \$125.00.

■ Bankcard and Master card accepted by phone. Add \$3.00 to all orders for postage and handling.

All orders must be prepaid.

UTILICO SOFTWARE

83 HALL ST., BONDI BEACH,
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WARNING: EDD is sold for making archival copies only

WP Breakthrough

WordMagic, the only full featured wordprocessor that's easier to use than a typewriter. And costs just \$139.00

Wordprocessing too difficult? Or too expensive?

If you've been putting off buying a wordprocessor because it appeared too involved and time consuming, you were probably right. Until now.

WordMagic is here to change your mind.

How? WordMagic is the only wordprocessor that is actually easier to use than a typewriter. Yet it runs rings around programs that boast about 'high performance'.

We won't ask you to spend hours training. WordMagic's commands are so simple and logical that you can start writing straight away.

On-screen menus and prompts make it a breeze.

And you get a manual that assumes you're a writer, not a computer expert.

We've put in features you *really* need. Like true 'what you see is what you get'. And a typewriter mode for all those little jobs, like typing forms and envelopes, which are impossible on most other wordprocessors.

Feature	Word Star	Word	Word Magic
Full WYSIWYG	N	Y	Y
Simple mnemonic commands	N	N	Y
Automatic save to disk	N	N	Y
Select printer from menu	N	Y	Y
Typewriter mode	N	Y	Y
Select draft/letter quality	N	Y	Y
Support DOS directories	N	Y	Y
Construct DOS directories	N	N	Y
Instant word count	N	N	Y
True microjustification	N	Y	Y
Graphics on screen and printing	N	Y	Y
Upper/lower case conversion	N	N	Y
Print multiple copies	N	Y	Y
Whole program in memory for fast response	N	N	Y
Bold, underline onscreen	N	Y	Y

WordMagic *thinks ahead* for you too. With an automatic save facility, that stores your text as you go, rather than waiting for you to lose all your work if the plug falls out!

And we appreciate that the most important thing to you is the look of the final product – the printed output. So WordMagic delivers the highest print quality you can get. With true microjustification and proportional printing.

WordMagic is available for IBM PC and compatibles, MS-DOS computers and nearly all CP/M machines, including Microbee, Osborne and Apple.

Natwick Management

Suite 2/25 Burns Bay Road,
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Phone (02) 428 1666

WordMagic



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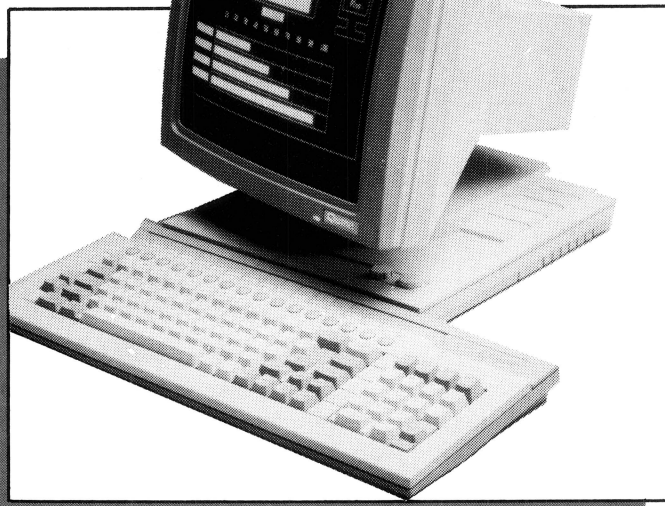
Cheque ☐ Credit card: Bankcard ☐ VISA ☐ Mastercard ☐

No:

Signature: _____ Expiry date _____

NEW PRODUCTS

The QVT Plus has been upgraded with a host of new features for this new release — such features as four pages of memory as standard, various foreign character sets, and a height-adjustable keyboard with 16 function keys providing up to 44 programmable functions. The ergonomic keyboard is a new design that uses colour and shape to help differentiate function groups. The screen features a 35 cm non-glare screen which tilts and swivels. A green screen is standard, but an amber screen is available. Both models feature a screen-saver circuit which shuts down the video to avoid burn-in if the terminal has been inactive for 15 minutes. Behind the scenes, the QVT 101 Plus provides two ports. The main port is an EIA RS-232C DTE (or optional RS-422), with auxiliary RS-232 being configured for bidirectional DCE operations. Baud



rates can be selected from 50 to 19,200 and the terminal has full parity control, half and full duplex, and XON/XOFF protocols.

**IBM-Compatible
Colour Graphics Monitor**
Microprocessor Applications
Phone: (03) 894 1500



Price: not supplied

The Wy-630 is an IBM CGA-compatible monitor which features a 14 inch display, tilt and swivel features, a green mono text which can be adjusted to nine different shades. The Wy-640 has the same features but has 640 by 350 pixel resolution which makes use of the 64 colour palette, with a possible 16 colours able to be displayed on the screen.

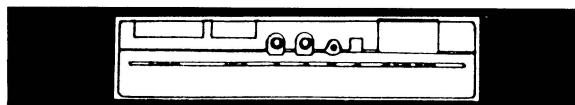
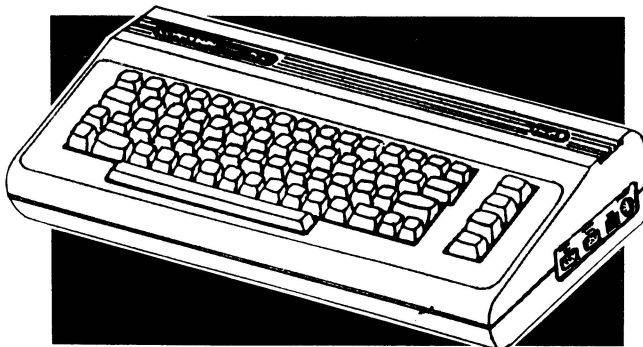
Peripherals

**Colour Graphics
Board for IBM PC**

Roland Australia
Phone: (03) 241 1254
Price: not supplied

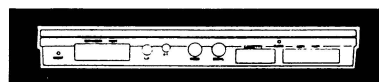
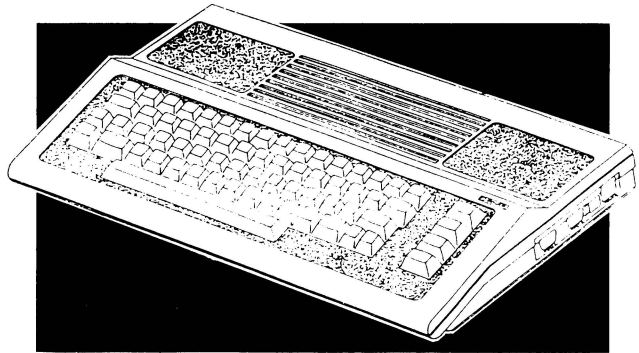
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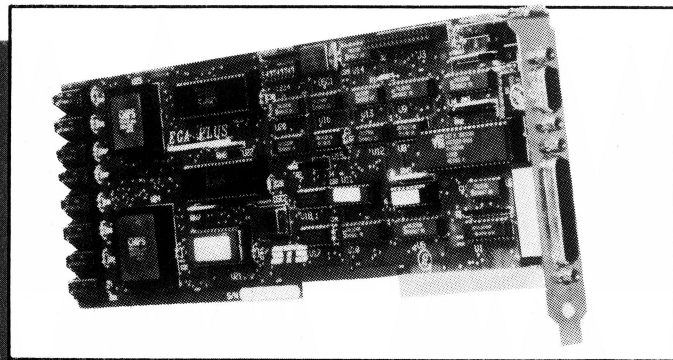
★ NEW LOWERED KEYBOARD ★ SLIM LINES ★ MODERN STYLING
★ RESET & DOLPHIN DOS BLANKS FITTED

Soon to come the Numeric Keypad Adaptor. Simply remove chassis from old case and drop straight into our new one, its that easy.

AVAILABLE FROM ALL OUR AUTHORISED DEALERS OR DIRECT FROM MICRO ACCESSORIES OF S.A. (08) 287 0191

NEW PRODUCTS

Roland Australia has released a fully multi resolution video adaptor for IBM colour graphics users. The board, the STB EGA Multi-Res, will run any IBM compatible monitor including monochrome, RGB colour, EGA screen and multi-sync monitors. The EGA Multi-res is in the full 16 colours or alternatively 752 by 410 resolution. The EGA Multi-Res comes with drivers for Microsoft windows, a parallel printer port 250 Kbyte of standard display memory, light pen interface, and has an optional clock-calendar. The accompanying PC Accelerator software provides 64 Kbyte of printer buffering and multiple RAM disk emulation. ▽



High Contrast PolaChrome

Polaroid Australia

Phone: (02) 887 2209

Price: not supplied

Polaroid has come out with a new instant 35 mm colour slide film designed for use in presentations featuring computer generated images. The film is for use with the Polaroid Palette screen camera which captures colour spreadsheets and graphs for corporate presentation. The combination of the film and the Palette will be best suited for tight deadline or security sensitive presentations in business, science, medicine and industry. The new film provides greater contrast in colours and can be developed on an executives desk or out in the field.

IVAC 750 Accelerator Board

Kairinsky and Associates

Phone: (02) 436 4477

Price: \$18,900 list price

For those who have a VAX 11/750 tucked away in the closet or the attic, this little marvel from Kai-

rinsky is aimed at getting you running more quickly. It improves system speed by providing a new clock which pulses variably, according to the exact time required for each instruction, rather than a fixed pulse of the older version. The IVAC 750 is transparent to system and application level software and requires no modification.

Mondtronic PIO-1212

Mondtronic

Phone: (03) 232 4110

Price: \$276 taxed

Designed, built and supported in Australia, the Mondtronic PIO-1212 is a general purpose input/output board, designed to inter-

face via the Mondtronic PIO-6U to the IBM PC/XT/AT. Connection is established through a 50-pin polarising ribbon connector and through a standard or twisted pair ribbon cable. The PIO-1 212 provides 12 independent I/Os and will accept any DC or AC voltage from 5V to 25V, in addition each input is provided with a switch selectable contact debounce, reducing software overheads. The outputs are designed to switch resistive or inductive loads such as lamps, relays and solenoids. They are rated DC 50V at 800mA and surge current of 2.5A. A 10V to 25V 100mA DC supply is required for the outputs. ▽

One 'Blind' Mouse

IBM

Phone: (02) 634 9111

Price: not supplied for Australia

From across the seas, comes the story of how blind people will now be able to read personal computer screens with a (still experimental) mouse. The mouse

works by raising tiny 'pistons' at a user's fingertips as the mouse is moved across a desktop tablet, spelling out in braille the characters, words and symbols on the screen. No special software or training is required to use the device, provided the user can read braille. According to IBM scientists, it could even be used to teach braille. The mouse, a special personal computer adaptor card and a tablet, plug into the personal computer system's chassis. To make reading easier the mouse can track each line on the display. Rows and columns are engraved on the tablet in braille as a quick location guide, and a fingertip switch lets the user 'ask' where the cursor is on the screen. The person is then given a row and column number in braille.

Remington's PC-Scan

Remington Office Automation

Phone: (02) 269 0925

Price: not supplied

For those who have the old version PC-Scan, they can now hunt around for the updated PC-Scan Plus which can read graphics and text. The Plus provides halftone scanning in 16 shades of grey, and provides a fast method of incorporating photographs and images into desktop publishing documents. The scanner utilises an Intel 80186 microprocessor with 750 Kbyte of RAM and special purpose VLSI circuitry. It provides a resolution of 300 dots per inch at input speeds of a page every nine minutes.



Saitek Printer Selector

Computermax

Phone: (02) 93 1383

Price: \$149 taxed

This handy bit of hardware enables one or two computers with parallel output to link up with one or two parallel printers. The choice of printer can be manually selected or software controlled from one of the computers. When connected to two computers, the Saitek unit will automatically scan them both and lock on when it receives a print signal. There is a manual override on channel selection and a builtin closed-loop diagnostic self-test.

The Kurta Penmouse

Minicomp

Phone: (02) 957 6800

Price: \$855 taxed

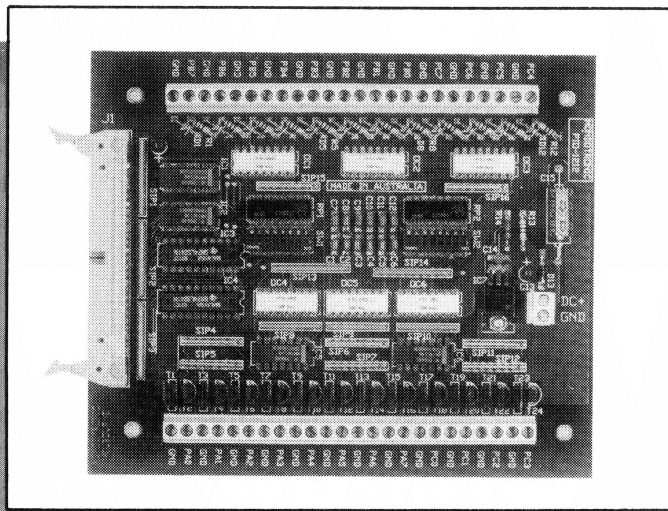
Mouse using Macintosh users can now update their aging mice with minicomps Kurta Penmouse. The new mouse uses an 8.5 by 11 inch tablet. It comes with a choice of Pen Stylus or cursor, the Pendraw software and necessary cables. The resolution of the Penmouse is switch selectable up to 1,000 dpi and comes with a cordless stylus or cursor.

Touch Screens

Monex

Phone: (07) 832 0345

Price: not supplied



NEW PRODUCTS

Monex has brought a range of touch screens for the IBM PC's and compatibles. They can be attached to any 9 in or 15 in monitor because of its higher clock rate. All the screens have a response rate of seven milliseconds.

Services

Stockwatch

Moneycentre

Phone: (02) 281 1666

Price: see below

Australia's finance community

can now access a new international electronic information network called Moneycentre. By using an IBM (or compatible), users can access foreign exchange, commodity, future and equity markets in all the major trading centers around the world. The information can be presented in seven types of real-time charts: bar, continuous, spread, minute-average, moving average, oscillator and tick (time and scale). Both intra- and inter-day charts can be created and moveable trend lines are easy to

add. Other features include audible and visual alerts, split screens, user-customised page formats and one keystroke function to access users on tailored displays. The system already boasts over 50,000 users. Fees for the service are based on users requirements and range from \$400 a month to access any two exchanges in the world, up to \$2,500 a month for unlimited service.

Recycling Laser Printer Cartridges
Viva Computer Products

Phone: (02) 908 4311

Price: \$100 per cartridge

Cartridges from all brand of Canon-driven printers can now be refilled. For those luck enough to afford a laser printer, the new method of recycling will be cost only around \$100 instead of near \$230 for each cartridge. According to the company, each drum is good for up to 12,000 copies but comes with only enough toner for 3,000 copies to be run off. Before you throw out all those old drums, send them off to Viva and collect \$10.

XENIX SYSTEM V

The Unix for Business & Commerce

NOW AVAILABLE

XENIX 286: IBM AT & close compatibles, TI PRO, Olivetti M28, Compaq, NCR PC8, Mitsubishi 286, Corona ATP, Sperry PCIT.
XENIX 86: IBM XT & close compatibles, ITT, Olivetti M24, Sperry, Wyse, Compaq, Ericsson, Leading Edge, Mitsubishi, NCR PC86, Tandy 1200.
XENIX 68K: Macintosh XL.
XENIX 11: PDP-11/23, PDP-11/73, Pro 350, Pro 380. (Note: XENIX 11 is not System V).

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- Xenix is an entire software family.
- Xenix lets users tailor their environments.
- Electronic mail.
- Small, fast kernel — Full Unix System V optimised for speed on micro-computers.
- Xenix has been installed on more microprocessor-based computers than all other UNIX based operating systems combined.
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- Xenix is full UNIX system V, only better.
- Xenix has superior multi-tasking design.
- Xenix is tuned for the micro-computer environment.

WHY BLUE SKY?

- We have been in business since 1978.
- We have been involved with computers since our inception.
- First Xenix sold in 1982.
- We know Xenix.
- Some of our customers include: NCR — Health Commission — Commonwealth Bank — Westpac — Telecom Australia — Philips — TAFE — WICAT — Dept. Science & Technology — University of New South Wales — University of Sydney.

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Blue Sky Industries designed and developed the extremely versatile system now marketed by NASHUA as the NASHUA DATA CONVERTER. • We provide a disk-to-(& from)-magnetic tape transfer bureau. • MAGTAPE — FLOPPY * UNIX — MSDOS — CP/M — CP/M-86 — PCDOS. 8" — 5.25" — 3.5"

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8 MPC
8 RS232 Ports with high-speed intelligent controller and Xenix Driver.

	CP/M-80	CP/M-86	PCDOS	MSDOS	Xenix V.85	Xenix III 286	Xenix V.386
T/MAKER III integrated office	•	•	•	•	•	•	•
MULTIPLAN spreadsheet					•	•	•
INFORMIX relational database					•	•	•
LYRIX word processing					•	•	•
LEVEL 2 COBOL Ansi 74 standard					•	•	•
FORMS 2 Cobol Development Tool					•	•	•
ANIMATOR Cobol Symbolic debugger					•	•	•
C-ISAM					•	•	•
IBM MAINFRAME COMMUNICATIONS					•	•	•
SCO PROFESSIONAL 1-2-3-					•	•	•
SCO UNIPATH SNA					•	•	•
FOXBASE					•	•	•
FOXBASE RUN TIME					•	•	•
XENIX NET					•	•	•
NEW	NEW	NEW	NEW	NEW			
Version 2.2 RUN TIME					•	•	•
FOXBASE PLUS					•	•	•

HARDWARE

- Winchester disk controllers for S-100, IBM PC, stand-alone.
- 8 Port intelligent communications board for S-100, IBM PC, IBM AT.
- Streaming tape back-up for Xenix.
- Statistical Multiplexers 8-16-24 ports with error correction.

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International: +612 419 5579. Telex: 74994.

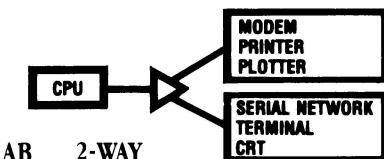
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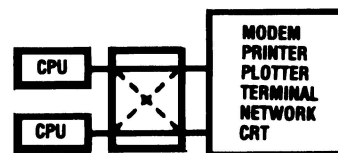
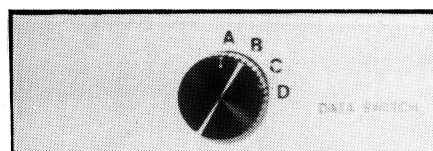
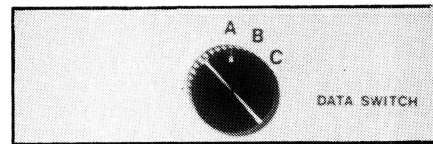
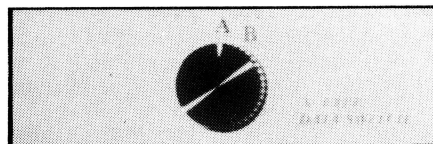
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- ☐ Televideo 910, 912, 925, 950
- ☐ IBM ☐ 3101 Hazeltine 1500
- ☐ Espirit series

plus many more – over 40 in total.

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Easy	\$220
dBase III+	\$755
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- 20Mb & Controller NEC	\$900
- 42Mb & Controller (v/c)	\$1750
- 71Mb & Controller (v/c)	\$2800

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- Composite Hi-Res	\$199
- Monochrome Hi-Res G or A	\$275
- TVMMD3 14" Colour	\$750
- TVMMD7 14" Colour Hi-Res (EGA)	\$960
- Thompson 36512	\$630
- Thompson 36382	\$770
- Thompson 31311	\$1050
- NEC MULTISYNC	CALL

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- Brother M-1109 80 Col	\$420
- Brother M-1509 132 Col	\$825
- Twinwriter 5 Dual-Head	\$2100
- Star NX10	\$525
- Star NL10	\$475
- Star NB15 300CPS	\$1795

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A T I B L E F U L L - S E R V I C E R E T A I L E R !

National PAMS Listing

FIRST, I'D LIKE TO thank Michael Tang who (for as long as I can remember) has maintained an excellent list of the Sydney area bulletin boards. And, I'm also grateful to Graeme Platt, the sysop of the Nemo in WA — *thanks for the user manual, Graeme!*

Now — to all the people who complain about the listing being incorrect, and it's usually that a system has shut down but it's still on the list — let me point out a couple of truths. First, we do check *all* new entries to the listing before publishing them, and second, the costs of maintaining the listing are borne by the good graces of AED Systems Development. But, those of us maintaining the list cannot afford to ring every registered board every month to see if it is still operating. So — if you run a board and shutdown, advise the registry; if *any* of the informa-

tion is wrong, then let us know! Users of bulletin boards are welcome to advise us of changes, but it is the responsibility of the system operator to advise the registry — at least now you only have to advise one place!

That feels better. A complete National PAMS Listing follows, so don't look for correction in this issue. Use it to replace your old listing — users are particularly warned about the number of changes to Victorian boards we've picked up in the last month.

Note: any company interested in using the list should contact me at the address below — a charge applies but that also covers monthly updates.

If you're a sysop, and your board is not listed here, please register as we'd like to make this the definitive list for all PAMS in Australia. To register your board, we'll

need the following details —

- ☐ System name,
- ☐ Hours of operation,
- ☐ Telephone number,
- ☐ User access (Public, Member, Visitor, Limited Visitor),
- ☐ Sysop's name (optional),
- ☐ Protocol (V21, V22, V22bis and so on),
- ☐ Profile (optional; what interest group your system caters for, membership information and so on),
- ☐ Contact name, address and phone number (not for publication).

The information (and complete lists when published) are always prepared with care, and are presented in good faith from information provided by various sources. The latest listing is always available from —

```

+-----+
: AED-PROPHET AUSTRALIAN PAMS LISTING                                RELEASE: 8702
:
: AUSTRALIAN CAPITAL TERRITORY
+-----+
: A.C.T. Amiga Users Group      :
: Phone: (062) 59-1137          : V21/V22/V23
:
: Sysop: Mike Hurst-Meyers      : Mem/LVA
+-----+
: Commodore Users Group BBS     : 24 Hours
: Phone: (062) 81-0847          :
:
: Sysop: James Hacker           :
+-----+
: Comtel BBS                    : 24 Hours
: Phone: (062) 59-1244          :
:
: Sysop: Warren Mason           : Mem/VA
+-----+
: Datalink                      : 24 hours daily
: Phone: (062) 99-1543          : V21
:
: Sysop: Fred                   : Public
+-----+
: Fat Cat                       : 24 Hours
: Phone: (062) 41-4395          :
:
: Sysop: Ross Boys              : Mem/LVA
+-----+
: Gateway A.I.B.B.S.            : 24 hours daily
: Phone: (062) 47-4820          : V21/22/23
:
: Sysop: James Collins          : Public
+-----+
: MICSIG                        :
: Phone: (062) 85-1026          : V21/V22/V23
:
: Sysop: Ross Boys              : Public
+-----+
: PC Exchange RIBM              : 24 Hours
: Phone: (062) 58-1406          : Supports all baud rates
:
: Sysop: Phil Harding           : Mem/LVA
+-----+
: Professional Computer Users Group : 24 Hours
: Phone: (062) 59-1244          : All Baud Rates
:
: Sysop: Alan Salmon            : Mem/LVA
+-----+

```

```

+-----+
: AED-PROPHET AUSTRALIAN PAMS LISTING
:
: NEW SOUTH WALES
+-----+
: ABCOM FIDO
: Phone: (047) 36-4165
:
: Sysop: Ben Sharif
+-----+
: ACE ATARI
: Phone: (02) 560-9846
:
: Sysop: Jeff Maddock
+-----+
: Adventure Line C-64 BBS
: Phone: (02) 636-9027
:
: Sysop:
+-----+
: Apple Users Group BBS
: Phone: (02) 498-7084
:
: Sysop: Matthew Barnes & Andrew Riley
+-----+
: Arco-Tel BBS
: Phone: (02) 683-3956
:
: Sysop: Alex Szx
+-----+
: AUGUR TBBS
: Phone: (02) 661-4739
:
: Sysop: Mark James
+-----+
: Ausborne (Osborne) RCPM
: Phone: (02) 439-7072
:
: Sysop: Daniel Moran
+-----+
: Dingo's Den Fido-Net
: Phone: (02) 888-2203
:
: Sysop: David Harvey
+-----+
: Eagle's Nest C-64 BBS
: Phone: (02) 451-0535
:
: Sysop: Phillip Dean
+-----+

```


National PAMS Listing

ACT: (062) 58 1406 PC Exchange RIBM
 NSW: (02) 628 7030 Prophet BBS
 (02) 628 5222 AED-Prophet
 VIC: (03) 89 5582 National BBS
 QLD: (07) 263 7070 AMPAK RCP/M
 (07) 38 6872 Hi-Tech BBS
 SA: (08) 260 6222 The Electronic Oracle
 WA: (09) 370-1855 Nemo Multiple RAPL
 BBS

All information or requests to be included in the monthly distribution should be sent to:

Australian PAMS Coordinator,
 Prophet Bulletin Board
 PO Box E41
 Emerton NSW 2770

Please note a charge applies to receive the lists monthly. All bulletin boards are encouraged to download the list from one of those boards listed above. ☐

Australian Pick Users' BBS	: 24 Hours
Phone: (02) 631-8603	: V21/V22/V23/V22bis
Sysop: Kurt Johannessen	: Reg/VA
Bee-Hive BBS	: Fri, Sat, Sun & Mon 2100 - 0600
Phone: (02) 520-7237	
Sysop: Paul Pinches	: Public
Bert BBS (Videotext)	: 24 Hours - V23 ONLY
Phone: (02) 211-0855	
Sysop:	: Public
Blackboard BBS	: 24 Hours
Phone: (02) 526-1343	: V21
Sysop: Will Black	: Reg/VA
Books BBS	: 24 Hours
Phone: (02) 525-5781	: Supports all baud rates
Sysop: Chris Ruwoldt	: Reg/LVA
Club Mac BBS	: 24 Hours
Phone: (02) 521-1359	: V21/22/23/22bis
Sysop: Ray King	: Mem/VA
Club-80 RTRS	: 24 Hours
Phone: (02) 332-2494	: V21/23
Sysop: Michael Cooper	: Mem/VA
Co-Co Connection	: 24 Hours
Phone: (02) 616-3591	
Sysop: Barry Darnton	: Reg/LVA
Comet C-64 BBS	: 24 Hours
Phone: (02) 599-7342	: Requires RTERM
Sysop: Eric Davis	: Mem/VA
Comm Link KBBS	
Phone: (02) 875-4817	
Sysop: Michael Hayter	: Reg/VA
Comm-Link KBBS	: 24 Hours
Phone: (043) 41-3135	: V21
Sysop: Jeff Campbell	: Mem/Reg/VA
Commodore C-64 BBS	: 24 Hours
Phone: (02) 664-2334	: V21/23
Sysop: Graham Lee	: Mem/VA
Computer Connection	: Weekdays: 1700 - 2100
Phone: (02) 528-8968	: 1600 Saturday until 0900 Monday
Sysop: Hamish Bowly	: Reg
Contact BBS	: 24 Hours
Phone: (02) 550-1004	
Sysop: Steven Williams	: V21 V22 V23 Bell103,212
CSACE BBS	: 24 Hours
Phone: (02) 529-8249	
Sysop: Larry O'Keefe	: Mem/VA
Datacom KBBS	
Phone: (02) 643-1220	
Sysop: James Butler	: Mem/VA
Dick Smith RIBM	: 24 Hours
Phone: (02) 887-2276	
Sysop: Mark Grimmond	: Public

RELEASE: 8702	:
24 Hours	:
V21/22	:
Mem/VA	:
Weekdays: 1800 to 0900	:
Weekends: 24 Hours	:
Mem/VA	:
Weekdays: 2200 - 1700	:
Weekends: 2200 - 0800	:
Reg/VA	:
24 Hours	:
V21 V22 V23 V22bis	:
Mem/VA	:
24 Hours	:
Mem/LVA	:
24 Hours	:
V21	:
Reg/VA	:
24 Hours	:
Mem/VA	:
V21/22/23	:
Reg/VA	:
24 hours daily	:
Mem/VA	:

```

: Fantasy C-64 : 2100 to 0730 :
: Phone: (02) 93-5225 :
: :
: Sysop: : Reg/VA :
+-----+
: Fido Australia : :
: Phone: (02) 959-3712 : V21/22/22bis :
: :
: Sysop: B & L Gatenby & R Morgan :
+-----+
: Galaxy RAPL : 24 Hours :
: Phone: (02) 875-3943 : V21 :
: :
: Sysop: Chris Nelligan : Mem/LVA :
+-----+
: Griffith Computer Association BBS : -* RING BACK *- :
: Phone: (069) 62-7272 : V21,V23 :
: :
: Sysop: Greg Bodger : Public :
+-----+
: Illawarra BBS - C64 : 24 Hours :
: Phone: (042) 84-4354 : :
: :
: Sysop: John Simon : Reg/VA :
+-----+
: Info-Centre BBS : 24 Hours :
: Phone: (02) 344-9511 : :
: :
: Sysop: Paris Radio : Mem/VA :
+-----+
: InterTan Fido : 24 Hours :
: Phone: (02) 625-8071 : :
: :
: Sysop: : Reg/VA :
+-----+
: Laser Line Fido : 24 hours daily :
: Phone: (02) 997-6820 : V21/22/23/22bis :
: :
: Sysop: Ward Britton : Mem/VA :
+-----+
: Manly BBS : C-64 Needs Rterm or Ultraterm :
: Phone: (02) 977-6820 : :
: :
: Sysop: Chris Patten : Reg/VA :
+-----+
: Metebeelus RBBS : Mon-Fri 1800-0900 Thu 2200-0900 :
: Phone: (02) 349-2366 : Sat 1500 until Mon 0900 :
: :
: Sysop: Tony Kemper & William Nitske : Reg/VA :
+-----+
: Micro Design Lab : 24 Hours :
: Phone: (02) 663-0151 : :
: :
: Sysop: Kevin Lowton : Public :
+-----+
: Micro Mart C Users Fido : 24 hours daily :
: Phone: (02) 560-3607 : V21/22/23/22bis :
: :
: Sysop: Rick Polito : Reg/VA :
+-----+
: Nebula BBS (Apple) : 24 Hours :
: Phone: (02) 407-2729 : V21 :
: :
: Sysop: Sean Craig : Mem/VA :
+-----+
: Newcastle Micro Club RCPM : Weekdays: 1700 to 0830 :
: Phone: (049) 68-5385 : Weekends/Public Holidays: 24 Hours :
: :
: Sysop: Tony Nicholson : Mem/VA :
+-----+
: NSW ACE BBS : 24 Hours :
: Phone: (02) 529-2059 : :
: :
: Sysop: Larry O'Keefe : Mem/VA :
+-----+
: Omega Line FIDO : 24 Hours :
: Phone: (02) 457-8281 : V21 V22 V23 :
: :
: Sysop: Geoff Arthur : Public :
+-----+
: Omen RTRS : Weekdays 1630 to 0900 :
: Phone: (02) 498-2495 : Weekends: 24 Hours :
: :
: : V21 & V23 :
: Sysop: Ted Romer : Public :
+-----+
: OS9 Connection (Co-Co) : Tuesday & Thursday: 1930-2200 :
: Phone: (02) 451-2954 : Saturday: 2000-0600 :
: :
: Sysop: Graeme Nichols : Mem/VA :
+-----+

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: Palantir C-64 BBS :
: Phone: (02) 451-6576 :
: :
: Sysop: Steve Sharp :
+-----+
: Paragon BBS :
: Phone: (02) 597-7007 :
: :
: Sysop: Jennifer Allen :
+-----+
: Phantomland :
: Phone: (02) 399-7716 :
: :
: Sysop: Bob James :
+-----+
: Prophet TBBS :
: Phone: (02) 628-7030 :
: :
: Sysop: Larry Lewis :
+-----+
: Pursuit C-64 BBS :
: Phone: (02) 522-9507 :
: :
: Sysop: Warren Hillsdon :
+-----+
: RCOM C-64 BBS :
: Phone: (02) 667-1930 :
: :
: Sysop: Simon Finch :
+-----+
: Realtors Fido-Net :
: Phone: (02) 387-5335 :
: :
: Sysop: Gary Stern :
+-----+
: Renegade Fido-Net :
: Phone: (02) 631-2715 :
: :
: Sysop: Sam Sarkis :
+-----+
: RUNX Unix System :
: Phone: (02) 487-2533 :
: :
: Sysop: Mark Webster :
+-----+
: Samilon Fidonet :
: Phone: (02) 80-3681 :
: :
: Sysop: Brian Houlahan :
+-----+
: Sci-Fi BBS :
: Phone: (02) 646-4865 :
: :
: Sysop: Greg Hope :
+-----+
: Sentry Fido-Net :
: Phone: (02) 428-4687 :
: :
: Sysop: Trev Roydhouse :
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: SMUG-BEE BBS :
: Phone: (02) 607-7584 :
: :
: Sysop: Bob Fryer :
+-----+
: Software Tools Remote :
: Phone: (02) 449-2618 :
: :
: Sysop: Bill Bolton :
+-----+
: Sorcerer Users Group FIDO :
: Phone: (02) 626-8020 :
: :
: Sysop: John Cepak :
+-----+
: Sydney PC Users RIBM :
: Phone: (02) 238-9034 :
: :
: : (02) 221-5520 :
: Sysop: Geoff May :
+-----+
: Tachyonics Fido-Net :
: Phone: (02) 438-2682 :
: :
: Sysop: Richard Lenz :
+-----+
: Tesseract RCPM+ :
: Phone: (02) 651-1404 :
: :
: Sysop: John Hastwell-Batten :
+-----+

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National PAMS Listing

: 24 Hours	:	: Texpac Electronic Magazine	:	: Weekdays: 1900 to 0700	:
: V21/V22/V23	:	: Phone: (02) 560-0926	:	: Weekends: 24 Hours	:
: Reg/VA	:	: Sysop: Shane Anderson	:	: Mem/LVA	:
: 24 Hours	:	: The Bulletin Board Fido-Net	:		:
: 21/V22/V23/V22bis	:	: Phone: (02) 80-3681	:	: V21 - 24 Hours	:
: Public	:	: (02) 690-9400	:	: V22 - 2000-0700	:
	:	: Sysop: Brian Houlahan	:	: Reg/VA	:
: 24 Hours	:	: The Idiom	:	: 24 hours daily	:
	:	: Phone: (02) 438-4060	:	: V22/V22bis	:
: Reg/VA	:	: Sysop: Stephen Beeby	:	: Reg/VA	:
: 24 Hours - V21	:	: Tubeline RIBM	:	: 24 Hours	:
	:	: Phone: (02) 681-3376	:		:
: Mem/Reg/LVA	:	: Sysop: Mark Buckingham	:	: Public	:
: 24 Hours	:	: Warringah BBS	:	: 24 Hours	:
	:	: Phone: (02) 977-0323	:	: V21/V22/V23 B103/212	:
: Mem/VA	:	: Sysop: Brian Wilde	:	: Mem/VA	:
: 24 Hours	:	: Your Computer RCPM	:	: 24 Hours	:
: Needs RTERM on C-64	:	: Phone: ***** OFFLINE *****	:		:
: Reg/VA	:	: Sysop:	:	: Mem/VA	:
: 24 Hours	:	: Zeta RTRS	:	: Weekdays: 24 Hours	:
: V22, B103/212	:	: Phone: (02) 627-4177	:	: Weekends: 1900 to 0700	:
	:	: Sysop: Nick Andrew	:	: V21,V22,V23,V22bis,Bell	:
	:		:	: Mem/VA	:
: 24 Hours	:		:		:
: All Baud Rates	:	: AED-PROPHET AUSTRALIAN PAMS LISTING	:	: RELEASE: 8702	:
: Public	:	: QUEENSLAND	:		:
: 24 Hours	:	: AMPAK PBBS/RCPM	:	: 24 Hours	:
: V21 (4 lines)	:	: Phone: (07) 263-7070	:	: V21/V22/V23/V22bis	:
: Mem/LVA	:	: 147.600 Mhz B4AC (Radio)	:	: 1200 bps Amateur Packet Radio	:
	:	: Sysop: Brian Wendt & John Bews	:	: Mem/Public	:
: Reg/VA	:	: Brisbane Commodore User Group BBS	:	: 24 Hours	:
: 24 Hours	:	: Phone: (07) 808-2125	:		:
: V21 V23	:	: Sysop: Ray King	:		:
: Public	:	: Brisbane Experimental RCP/M (BEX2)	:	: 24 Hours	:
: 24 Hours	:	: Phone: (07) 808-2125	:		:
: Mem/VA	:	: Sysop: Rik Dalley	:		:
: 24 Hours	:	: Brisbane Microbee User Group BBS	:	: 24 Hours EST	:
	:	: Phone: (07) 38-4833	:		:
: Reg/VA	:	: Sysop: Graham Scott	:	: Public	:
: 24 Hours	:	: Cairns & District 1BBS	:	: 24 Hours	:
	:	: Phone: (070) 51-1360	:		:
: 24 Hours	:	: Sysop: Neil Barker	:		:
: V22/V22bis	:	: COCO Link	:	: 24 Hours EST	:
: Public	:	: Phone: (075) 32-6370	:		:
: 24 Hours	:	: Sysop:	:		:
: V21	:	: Commodore Express	:		:
: Mem/VA	:	: Phone: (07) 393-5352	:		:
: 24 Hours	:	: Sysop: Craig Upton	:		:
: V22	:	: Computer Orchard	:		:
: Mem/VA	:	: Phone: (07) 350-1300	:		:
: 2200 - 0600 Daily	:	: Sysop: Scott Pierce	:		:
: Reg/VA	:	: Cynthia	:	: 24 Hours	:
: 24 Hours	:	: Phone: (07) 262-1269	:		:
: V21, V23, V22, V22bis	:	: Sysop: Martin Josephson	:		:
: Reg/VA	:	: Datanet Fido	:		:
	:	: Phone: (07) 356-4541	:		:
	:	: Sysop: Bill Bowden	:	: Public	:

President News on Ventura

President Computers release the Complete Desktop Publishing System

YOU MAY NOT REALIZE IT

but if you are like most businesses and organizations, you spend a lot of time and money publishing documents.

Think for a minute do you print :- memos, technical reports, marketing and sales manuals, catalogs, financial reports, forms, promotions, presentations or newsletters to name a few.

Maybe they are not always selling aids, but they are important to you, your company, your clients and customers, so why not make your printed material look its very best, to boost your companies overall presentation.

Now most businesses, can do just that - without the heavy cost, lengthy delays and needless complications on getting these type of documents produced professionally by graphic artists and typesetters.

NOW YOU CAN DO IT YOURSELF, with the newest and what we at President Computers think is the best Desktop Publishing System available, combining the fantastic XEROX VENTURA Publisher Software, with image scanning from our AVR-300 Flat Bed Scanner and our high speed output via President MegaPAGE Software and MegaBUFFER Card. XEROX VENTURA from President is a software package that combines efficiently into the President MegaPAGE system or your existing P.C. compatible office computer system.

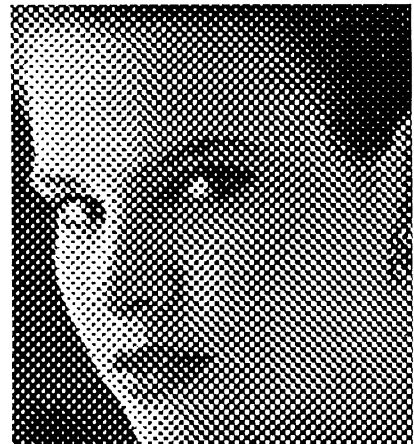
FULLY SUPPORTED

VENTURA is a package that is easy to use, easy to learn, and easy to integrate into your marketing, finance, documentation or any other office routine. Xerox Ventura the fastest, friendliest, most versatile desktop publishing software yet developed, is fully supported by President Computers Pty. Limited a leading Australian Company established over 18 years.

With XEROX Ventura Series, you get the features that are making desktop publishing much more than just another hot new trend, features that propel existing P.C. technology in new dramatic ways to improve productivity throughout any organization.

XEROX Ventura accepts new or existing text files directly from a wide range of P.C. word processing programmes; they do not even have to be compatible with each other. Ventura also accepts input in standard ASCII file format. With a click of your P.C. mouse you can simply select the word processor or other file type and flow information into the new document you are creating proposal, technical report, presentation, manual, page layout or whatever. XEROX Ventura utilising a pre-set or unique style sheet, then generates a completely formatted document and displays onto your computer screen exactly as it will appear when you print it.

XEROX Ventura in the President Sys-



copy to fit instantly, the system automatically reformats and re paginates the entire document as each change occurs. You do not have to duplicate your changes in the source text file, because XEROX Ventura publisher does that to, automatically.

Xerox Ventura incorporates graphics images into your documents from the most popular graphics, spreadsheet and C.A.D. programmes, or original logos, images, diagrams, photographs and some 3D objects scanned into the system on the President AVR-300 Flat Bed Scanner which scans a full A4 page at 300 dots per inch in an incredible 9 seconds. The composed text automatically flows around the graphic image or scan, and all the hyphenation and justification changes are made to fit the text and scanned graphics neatly together.

You can crop, enlarge or shrink a graphic and add background texture and if adding graphics of text means that the following pages need to be rearranged and repaginated, you do not have to keep track or memorise complex codes, Ventura does it all for you, even if it means adding new pages.

XEROX Ventura also relieves you the annoying "detail work" that goes into creating and finish, professional-looking documents, because it generates running headers for each chapter or section, numbers, section and subsection, puts footnotes where they belong, and generates indexes and table of contents easily and quickly, with a minimum of involvement on your part.

PRESIDENT Training

on Xerox Ventura is available from President Computers in all Capital Cities. President Computers "hands on" courses teach setup, installation procedures, style sheet creation, text formatting, graphics layout, scanning, facsimile and printing procedures. This gives the operator all the skills required to utilize XEROX Ventura. President award their Desktop Publishing Operators Certificate to those completing the Ventura course.

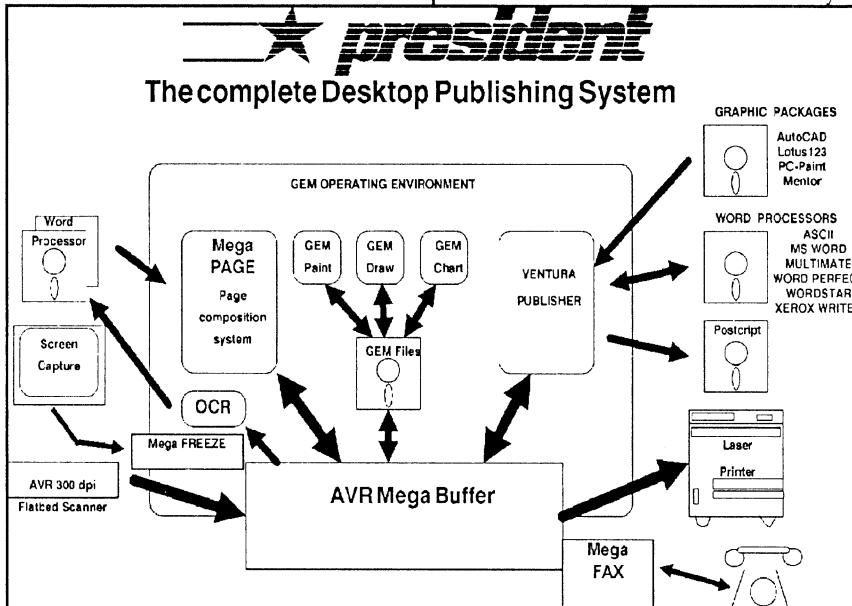


Figure 1 President Complete Desktop Publishing System

VENTURA will give you beautifully designed typeset quality documents that sustain and solidify an image of professionalism, imagination and care for detail.

tem makes routine changes easy too, with its built-in text editing function, after you have composed a page or a document you can add, delete, cut, duplicate, move text or compose directly all on your display screen. When you want to cut or add

President News on MegaPAGE

New Features and utilities make MegaPAGE the most advance page composition software

PRESIDENT COMPUTERS PTY. LIMITED,

An eighteen year old leading Australian owned Computer Company with manufacturing facilities on the Gold Coast Queensland, have boldly released a total systems solution for Desktop Publishing.

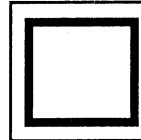
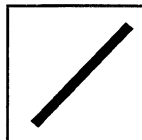
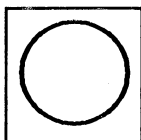
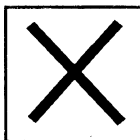
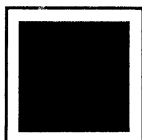
As Desktop Publishing requires so many hardware segments to make up a complete publishing system such as A.T. Computer, Hi-Resolution Monitor, Laser Printer, Image Scanner, Voice Coil Hard Disk, Tape Backup, Graphics Software and Publishing Software. It is most desirable, if not essential, for the customer to be able to source the complete system from one Computer House, a Company that offers total support, both hardware and software.

President Computers is offering total support on site for the complete system as well as a formal "hands on" training facility available in all major cities.

HARDWARE

Presidents hardware consists of a Publisher 286 Computer which is a custom A.T. built in Australia at Labrador, which incorporates a 80286 processor with 6-8-10 Mhz selectable speeds, a choice of 44 or 71 megabyte voice coil hard disk with fast access speeds, 60 megabyte of tape backup and a special 101 keyboard incorporates the new tactile positive keys. The standard CGA colour monitor is supplied or a choice of EGA or powerful Wyse-700 which displays 1260 x 800 lines. A specially modified Canon A1 Laser Printer comes with the system giving a full 300 D.P.I. resolution at 8 copies per minute. The AVR-300 Flatbed Scanner which is Australian Built is a key component which has the ability to scan any A4 document in an amazing 9 seconds at 300 D.P.I. the results are astoundingly high quality scans from sheets, photographs, oversized documents, books, even some 3 dimensional objects. With scanning, a flat bed scanner is essential to give all the flexibility and choice you will most certainly require.

The software President offers is the A.V.R. MegaSCAN page composition software, this software is fully interfaced with the AVR scanner, MegaSCAN is a most powerful graphics orientated package,, and is simple to use. MegaSCAN can manipulate scans or text introduced from your standard word processors or scanner, to compose pages with combinations of graphics and text fonts in amazingly short periods of time. In many applications MegaSCAN will be all the software you require. MegaSCAN has many advanced operations including drawing attributes, boxes, circles, eclipses, freehand as well as operation options such as outlines, reverse image, darken, lighten, halftone white, halftone black, move, copy, scale. MegaSCAN also has functions to photo enhance photographs, paint box which allows selection of 128 different patterns, smooth which will clean up rough scanned images and rotate. The ability to store files from most ASCII type word processors, then select from the vast range of type fonts and flow your text into preset areas of your page from embedded commands (like batch files) with features like centre, left justification, right justification etc, gives MegaSCAN the power to handle most layout requirements.



Standard Features

Mega Freeze

Allows you to capture complete screen images from your monitor and store and use at will, particularly useful for creation of training manuals etc.

Mega Disk

Allows you to access the 1.3 Megabyte MegaBUFFER Ram Card for normal software applications as Ram Disk.

Mega Gem

Transfers megabuffer files into Gem files and allows scanning into Ventura or Gem.

Mega Write

Is a Word Processor which creates a window on your page layout so you can input your text with word processing features and flow the finished text file directly into your page composition without leaving MegaPAGE.

OPTIONS

MegaFAX

option is the ability to use facsimile operation from your system by adding MegaFAX, you can also scan an image, create a page layout and fax it directly from your system to any other fax machine in the world, or if you have a computer on the other end of the line with suitable receiving ability you can receive the transmission directly into your computer system and print out on a laser printer for camera ready art. MegaFAX has a number of features such as auto dial auto receive so that you can preset your fax transmissions with after hours telephone rates for transmissions and you can receive transmissions after hours and for security store them directly into your computer awaiting printout instructions at your convenience.

Mega Read

is an OCR Optical Character Recognition option due to be released shortly which allows typewritten documents to be scanned into the system converted to ASCII text files and manipulated edited and reprinted in a new format.

Training,

President has opened three full time training centres in Sydney, Melbourne and Brisbane to give XEROX Ventura publishing software "hands on" operator training programmes.

The President Certificate indicates that the operator has been trained on - Ventura Software, MegaPAGE Software, Scanning, Page makeup, Fax facilities, Screen Capture.

The Courses run over three consecutive days at a total cost of \$350.00 President will have additional training facilities in Canberra in late March 1987.

```

: Educational RCPM :
: Phone: (07) 266-3369 :
:
: Sysop: Andrew Waddell :
+-----+
: Electric Dreams BBS :
: Phone: (07) 399-1322 :
:
: Sysop: Joe Altoff :
+-----+
: Futex C-64 :
: Phone: (07) 283-2034 :
:
: Sysop: Paul Salanitri :
+-----+
: Hi-Tech CBBS : 24 Hours EST :
: Phone: (07) 38-6872 :
:
: Sysop: Clyde Smith-Stubbs :
+-----+
: Hotline : 24 Hours :
: Phone: (07) 353-3718 : V21/V23/B202 :
: : logon at V21 and request change :
: Sysop: Lionel Theunissen :
+-----+
: Info Interchange C-64 :
: Phone: (07) 200-7664 :
:
: Sysop: :
+-----+
: Kangaroo Point TAFE : Mon - Fri: 0900 - 2200 :
: Phone: (07) 393-1763 : Sat & Sun: 24 Hours :
: : V21/V23 :
: Sysop: Troy O'Malley :
+-----+
: Mackay High School BBS : Weekdays: 1600 - 0730 :
: Phone: (079) 51-4815 : Weekends: 24 Hours :
:
: Sysop: Bob Chalmers : Public :
+-----+
: Rapple - Q :
: Phone: (07) 284-6145 : V21/22/23/22bis :
:
: Sysop: T Sweetser G Black V Crosdale :
+-----+
: Soft-Tech Fidonet :
: Phone: (07) 203-6864 : V21/V22/V23/V22bis/8103/B212 :
:
: Sysop: Alwyn Smith : Public :
+-----+
: Software 80 BBS : Weekdays: 1930 - 0800 :
: Phone: (07) 369-7103 : Weekends: from 1430 Sat - 0800 Mon :
: : V21/23 :
: Sysop: Tony Melius : Reg/VA :
+-----+
: Telegold :
: Phone: (075) 31-6155 :
:
: Sysop: :
+-----+
: Tomorrowland RMSD : 24 Hours :
: Phone: (07) 394-2300 :
:
: Sysop: :
+-----+
: Toowoomba Computer Centre : Weekdays: 1800-0800 :
: Phone: (076) 32-7542 : Weekends: 24 Hours :
:
: Sysop: :
+-----+
: Please report any changes or new listings to: Australian PAMS Coordinator :
: : Prophet Bulletin Board :
: Electronic: BBS (02) 628-7030 : PO Box E41 :
: : Emerton NSW 2770 :
: Old Contact: Ampak RCPM (07) 263-7070 :
+-----+
: AED-PROPHET AUSTRALIAN PAMS LISTING : RELEASE: 8702 :
:
: SOUTH AUSTRALIA :
+-----+
: Adelaide Micro User Group BBS : 24 Hours :
: Phone: (08) 271-2043 :
:
: Sysop: Richard Newcombe : Reg/LVA :
+-----+
: Adelaide Microbee BBS : Mon - Thur 1800 - 0800 :
: Phone: (08) 212-6569 : Fri 2100 - Mon 0830 :
:
: Sysop: Ron Carson & Mark Hammond :
+-----+

```

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: Multiple System BBS :
: Phone: (08) 255-5116 :
:
: Sysop: Danny Vozzo :
+-----+
: Nexus Education Dept BBS :
: Phone: (08) 243-2477 :
:
: Sysop: :
+-----+
: Omen V RTRS :
: Phone: (08) 356-7939 :
:
: Sysop: Richard Siggs :
+-----+
: Outback RCPM :
: Phone: (089) 27-7111 :
:
: Sysop: Phil Sampson :
+-----+
: SA Commodore BBS :
: Phone: (08) 371-0435 :
:
: Sysop: Peter Hinton & Gerry :
+-----+
: The Electronic Oracle 1BBS :
: Phone: (08) 260-6222 :
:
: Sysop: Don Crago & Grayham Smith :
+-----+
: Please report any changes or new list :
: Electronic: BBS (02) 628-7030 :
:
+-----+
: AED-PROPHET AUSTRALIAN PAMS LISTING :
:
: TASMANIA :
+-----+
: Tassie Bread Board System :
: Phone: (003) 26-4248 :
:
: Sysop: Ian Campbell :
+-----+
: Please report any changes or new list :
: Electronic: BBS (02) 628-7030 :
:
+-----+
: AED-PROPHET AUSTRALIAN PAMS LISTING :
:
: VICTORIA :
+-----+
: ABACUS RCP/M :
: Phone: (057) 83-1964 :
:
: Sysop: Maurice Copeland :
+-----+
: ABE :
: Phone: (03) 288-3599 :
:
: Sysop: Richard Gardiner :
+-----+
: AHUBBS :
: Phone: (03) 762-1582 :
:
: Sysop: John Forbes :
+-----+
: AM-NET :
: Phone: (03) 366-7055 :
:
: Sysop: Peter Hallgarten :
+-----+
: Apple Hackers BBS :
: Phone: (03) 762-1582 :
:
: Sysop: John Forbes :
+-----+
: Atlantis RBBS-PC :
: Phone: (03) 277-6824 :
:
: Sysop: John Edwards :
+-----+
: AUSOM :
: Phone: (03) 877-1970 :
:
: Sysop: Grahame Willis :
+-----+

```


National PAMS Listing

```

: Daily: 2100 to 0900 :
: V21/22/23/22bis :
: Reg/LVA :
: 24 Hours CST :
: :
: Reg Only :
: 24 Hours :
: :
: Reg/LVA :
: 24 Hours CST :
: :
: 24 Hours :
: COMMODORE ONLY :
: Reg/LVA :
: 24 Hours CST :
: V21,22,23,22bis :
: Rotary Group Number :
: Reg/LVA :
ings to: Australian PAMS Coordinator :
: Prophet Bulletin Board :
: PO Box E41 :
: Emerton NSW 2770 :
:
: G RELEASE: 8702 :
:
: 24 Hours :
: V21/V22/V23/V22bis :
: :
: :
ings to: Australian PAMS Coordinator :
: Prophet Bulletin Board :
: PO Box E41 :
: Emerton NSW 2770 :
:
:
: 5 RELEASE: 8702 :
:
: 0800-1200, 1600-2300 7 Days :
: V21/23 (with auto back channel) :
: :
: Public :
: 24 Hours :
: V21/22 :
: :
: Public :
: 24 Hours :
: :
: :
: 24 Hours EST :
: V21/23 :
: Multiuser Turbo-dos :
: Mem/LVA :
: 24 Hours :
: :
: :
: 24 Hours :
: :
: :
: Public :
: 24 Hours :
: :
: :
: Public :

```

```

: Basis Users Group RCPM : Mon - Sat: 0000 to 1800 :
: Phone: (03) 500-0562 : Sunday: 0000 to 1200 :
: :
: Sysop: Sol Green :
:
: Bayside Fidonet :
: :
: Phone: (052) 51-4110 : V21/V22/V23 :
: :
: Sysop: :
:
: C-64 BBS : 24 Hours :
: Phone: (03) 489-4555 : :
: :
: Sysop: Alan Miles : Public :
:
: Castle Mania : Hours: 0700-0000 :
: Phone: (03) 379-5123 : :
: :
: Sysop: Mike Purdy :
:
: Colour C-64 BBS : Daily: 2300 - 0800 :
: Phone: (03) 579-2147 : :
: :
: Sysop: Alard Eales : Public :
:
: Commodore Board : Daily: 2200 - 0800 :
: Phone: (03) 875-1023 : :
: :
: Sysop: Keith Jarvis : Public :
:
: Custom Programming 1BBS : 24 Hours :
: Phone: (03) 848-3331 : V21 :
: :
: Sysop: Alan Williamson : Public :
:
: Cycom : Weekdays: 1800 - 0600 :
: Phone: (03) 727-1018 : Weekends: 24 Hours :
: : V21/22/23 :
: :
: Sysop: Darren Hayson :
:
: DECUS Fido-Net : 24 Hours :
: Phone: (03) 63-9133 : V21,V22,V23,V22bis :
: :
: Sysop: Jay Ondracek : Mem/LVA :
:
: Devil's Playground : 24 Hours :
: Phone: (03) 553-2728 : V21 :
: :
: Sysop: Nick Todd :
:
: Down Under Amiga Fido BBS : 24 Hours :
: Phone: (03) 429-8079 : V21/22/23/22bis :
: :
: Sysop: Greg Hudson :
:
: Down Under Software Fido-Net : 24 Hours :
: Phone: (03) 429-5819 : V21/22/23/22bis :
: :
: Sysop: Greg Hudson :
:
: Eastcom RBBS :
: :
: :
: Phone: (03) 288-0775 :
: :
: Sysop: Maurie Halkier : Public :
:
: Eastwood RCPM : 24 Hours :
: Phone: (03) 870-4623 : V21/23 :
: :
: Sysop: Mick Stock : Mem/LVA :
:
: Electronic Cross-Over Fido BBS : 24 Hours :
: Phone: (03) 367-5816 : V21 :
: :
: Sysop: Stephen Paddon :
:
: Further Regions Fido BBS : 24 Hours :
: Phone: (03) 725-3732 : V21 :
: :
: Sysop: Chris Brunton :
:
: Gippsland Mail-Bus : 24 Hours EST :
: Phone: (051) 27-7245 :
: :
: Sysop: Max Moore :
:
: Harbours-64 : 24 Hours :
: Phone: (03) 587-2504 :
: :
: Sysop: David Harbour : Mem/LVA :

```

: Hi-Tech BBS	: 24 Hours	:
: Phone: (03) 397-1165	:	:
:	:	:
: Sysop: Clement Maloney	: Mem/LVA	:

: Macboard BBS	: 24 Hours	:
: Phone: (03) 435-9152	: V21/22	:
:	:	:
: Sysop:	: Public	:

: Micom BBS	: 24 Hours	:
: Phone: (03) 762-5088	: Two lines	:
:	:	:
: Sysop: Peter Jetson	:	:

: Microbee RCPM	: 24 Hours EST	:
: Phone: (03) 82-1571	: V21/23	:
:	:	:
: Sysop: Mike Thompson	: Public	:

: MICROLINK	:	:
: Phone: (03) 233-0230	:	:
:	:	:
: Sysop:	:	:

: Micropro Computers RCPM	: 24 Hours EST	:
: Phone: (03) 568-8180	:	:
:	:	:
: Sysop: Graham Broadbridge Steve Whit	: Mem/LVA	:

: Midnight Frog Fido BBS	: 24 Hours	:
: Phone: (03) 596-1589	: V21/22/23/22bis	:
:	:	:
: Sysop: Scott Enwright	: Public	:

: Mike's Bullboard	: 24 Hours	:
: Phone: (03) 459-6439	: V21	:
:	:	:
: Sysop: Mike Lewis	:	:

: MIN-NET BBS	: 24 Hours	:
: Phone: (054) 41-3013	:	:
:	:	:
: Sysop: Max Fields	: Public	:

: Motel International	: 24 Hours	:
: Phone: (03) 509-9611	: All Baud Rates	:
:	:	:
: Sysop: Kim Gratton	: Public	:

: National Fido BBS	: 24 Hours	:
: Phone: (03) 819-5582	:	:
:	:	:
: Sysop: John Blackett-Smith	: Public	:

: Omega BBS	: Hours: 1900 - 0200	:
: Phone: (052) 22-1670	:	:
:	:	:
: Sysop: Mark Gregson	:	:

: Omen IV RTRS	: 24 Hours EST	:
: Phone: (03) 846-4034	:	:
:	:	:
: Sysop: Philip West	: Public	:

: Osborne Australia Bulletin Board	:	:
: Phone: (03) 529-3519	:	:
:	:	:
: Sysop: Craig Orr	: Reg/LVA	:

: Outer Limits Fido BBS	: 24 Hours	:
: Phone: (03) 725-6650	: V21	:
:	:	:
: Sysop: Peter Dorell	:	:

: Pacific Island	: 24 Hours	:
: Phone: (03) 890-2174	:	:
:	:	:
: Sysop: Craig Bowen	:	:

: PC Connection IBBS	: 24 Hours	:
: Phone: (03) 528-3750	: V21 & V22	:
:	:	:
: Sysop: Lloyd Barrett	:	:

: PC-Domain Fido BBS	: 24 Hours	:
: Phone: (03) 789-8918	: V21/22/23/22bis	:
:	:	:
: Sysop: Daryl Clayton	: Public	:

: PC-Oasis System 1	:	:
: Phone: (03) 848-3331	:	:
:	:	:
: Sysop: Alan Williamson	:	:

: PC-Oasis System 2	:	:
: Phone: (03) 898-3922	:	:
:	:	:
: Sysop: Craig Wilson	:	:

: Profit Fido-Net	:	:
: Phone: (03) 529-8749	:	:
:	:	:
: Sysop: Andrew Hooper	:	:

: Public Resource #1	:	:
: Phone: (03) 878-2918	:	:
:	:	:
: Sysop: D Harvey	:	:

: Public Resource #2	:	:
: Phone: (03) 690-7220	:	:
:	:	:
: Sysop: D Harvey, W Clarke, R Nagy	:	:

: Sams Fido-Net	:	:
: Phone: (03) 563-1117	:	:
:	:	:
: Sysop: Alan Haslar	:	:

: Sorcerer RCPM	:	:
: Phone: (03) 754-5081	:	:
:	:	:
: Sysop: David Woodberry	:	:

: Sunshine PC	:	:
: Phone: (03) 312-2259	:	:
:	:	:
: Sysop: Chris Whitefield	:	:

: Supermicros RBBS	:	:
: Phone: (03) 799-2001 V21	:	:
: (03) 799-2041 V21/22/23	:	:
: Sysop: Richard Tolhurst	:	:

: Tardis RCPM	:	:
: Phone: (03) 67-7760	:	:
:	:	:
: Sysop: Malcolm Miles	:	:

: Telegraph Road BBS-PC	:	:
: Phone: (03) 743-6173	:	:
:	:	:
: Sysop: Craig Wilson	:	:

: Ten to One Amiga BBS	:	:
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:	:	:
: Sysop: Mike Beckett	:	:

: TERMICOMNET	:	:
: Phone: (03) 589-1692	:	:
:	:	:
: Sysop:	:	:

: The Inner Sanctum Fido BBS	:	:
: Phone: (03) 233-8346	:	:
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: Sysop: Robert Swaab	:	:

: The Magic Pudding	:	:
: Phone: (03) 428-2178	:	:
:	:	:
: Sysop: Rupert Russell	:	:

: The Magic Pudding Fido BBS	:	:
: Phone: (03) 428-2178	:	:
:	:	:
: Sysop: Rupert Russell	:	:

: The Real Connection	:	:
: Phone: (03) 288-0331	:	:
:	:	:
: Sysop: Carla Miller & Andrew Moore	:	:

: The Real Connection Fido BBS	:	:
: Phone: (03) 288-0331	:	:
:	:	:
: Sysop: Carla Miller & Andrew Moore	:	:

National PAMS Listing

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: 24 Hours
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:
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+-----+
: 24 Hours
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+-----+
: V21/22/23/22bis
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+-----+
: 24 Hours
: Bell103 & V22 ONLY
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: Public
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: 24 Hours
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: 24 Hours
: V21/22/23/22bis
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: Weekdays: 1800 to 0800 EST
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: Weekends: 24 Hours EST
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: V21
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: 24 Hours
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: Public
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: Weekdays: 1930 - 0730
: Weekends: 24 Hours
: V21
: Mem/VA
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: Hours 1900-0700
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: Daily 1900 - 0700
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: Public
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: Public
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+-----+
: 24 Hours
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+-----+
: Public
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: The Ultimate-C64
: Phone: (03) 735-5551
:
: Sysop: Mike Kabiolke
+-----+
: Thunder-Net Amiga
: Phone: (03) 791-1124
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: Sysop:
+-----+
: VIDEOTEX 4000
: Phone: (03) 329-2936
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: Sysop:
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: Sysop: Bob Fletcher
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: Victorian Contact: The National Fido BBS (03) 819-5582 Emerton NSW 2770
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:
: WESTERN AUSTRALIA
+-----+
: Atari BBS
: Phone: (09) 409-7251
:
: Sysop:
+-----+
: Computex BBS
: Phone: (09) 447-0522
:
: Sysop: Russell Stokes
+-----+
: Mouse Exchange BBS
: Phone: (09) 330-5530
:
: Sysop: Leonard Hollings
+-----+
: Mouse Exchange BBS
: Phone: (09) 339-6890
:
: Sysop: Leonard Hollings
+-----+
: Nemo Multiple BBS RAPL
: Phone: (09) 370-1855
:
: Sysop: Graeme Platt
+-----+
: Omen III RTRS
: Phone: (09) 249-1555
:
: Sysop: Greg Watkins, Nigel Read
+-----+
: Omen Mini BBS
: Phone: (09) 279-8555
:
: Sysop: Greg Watkins
+-----+
: Perth PC Users BBS
: Phone: (09) 227-9229
:
: Sysop:
+-----+
: Student Access Message Service
: Phone: (09) 321-9721
:
: Sysop: Peter Walton & John Bramley
+-----+
: The Gathering BBS
: Phone: (09) 272-4711
:
: Sysop: Ken Peters
+-----+
: Z-Node 62
: Phone: (09) 450-0200
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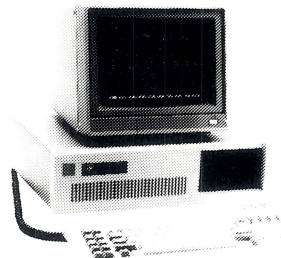
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EVERY SO OFTEN a product appears in the Public Domain like a bombshell. PC-Outline is just such a product, albeit from the grey area of user-supported software. To see why it's so interesting, let's look at the process that most of us go through to get our thoughts on 'paper' —

Outlining

How do you go about writing documentation for one of your programs? How do you write a memo, an article, a letter, a book? Formally or informally, the process is much the same — gather your thoughts, arrange them into order and then polish your prose. You might be able to think through a whole document, and then get it right on the first draft — if so, you are one of the lucky few.

The rest of us, the unlucky ones, tend to prepare notes on scrap paper, cards, backs of envelopes or the proverbial serviette. The next step is to arrange them in some sort of order and create a rough draft; several revisions later, this finally approaches the right size and says (approximately) what we want it to say.

How often, after that first draft, is it necessary to move major and minor elements, and how difficult it is to number sections and subsections and keep the numbering system accurate and logical without gaps or duplications? Of course, what we need in the above situation is a working outline of our thoughts and ideas — the outline gives organisation and makes the relationships between various parts of the 'writing' obvious. With an outline, manual or computerised, one first thinks of major headings for the various parts of a document; then, beneath each of these 'parent' levels will be various 'child' levels, each with its own heading and numbering system. I'm sure you have seen a document with a numbering system —

- 1. Chapter
 - 1.1 Section
 - 1.1.1 Subsection
 - 1.1.2 Subsection
 - 1.2 Section
- 2. Chapter

— or one using various combinations of numbers, upper and lower case letters, and upper and lower case Roman numerals.

'Computerised' Outliners, like the PC-Outline bombshell, allow the creation of the headings, the attachment of text, and the *easy* re-arrangement of the document

with automatic re-numbering whenever a block of text is moved.

Loading

PC-Outline can be used from hard disk or floppy, and can be found through a DOS path, provided that the location of the configuration file has been loaded into the DOS environment with a SET command in the AUTOEXEC.BAT file. It can be loaded either as a co-resident program (callable by the key combination CTRL-BACKSLASH) or in the conventional manner, releasing memory on exit.

Memory requirements vary. As a co-resident program the code takes around 60 Kbytes, and the default outline is 64 Kbytes, so around 128 Kbytes is typically used. If loaded in the conventional manner the code again takes 60 Kbytes, with the rest of memory being available for the outline.

On entering PC-Outline a menu appears. This allows four possibilities — create a new outline, load an existing outline, change drive or directory, or quit the program.

From that same opening menu, press O to open a new outline and then enter the file name: PC-Outline adds the extension .PCO, and an editing screen is displayed.

If the user presses L for 'Load an Existing Outline', all .PCO files in the default directory are displayed. The desired file is then selected and loaded.

The Screen

The screen has a single line border, and four lines of status and other information. The top line shows the names of the 9 command menus — FILE, OUTLINE, EDIT, DISPLAY, PRINT, HIDE, SHOW, WINDOW and ADVANCED. The next line shows the filename, the current size of the outline in kilobytes, INS or OVER (the 'overtyping' toggle indicator), the page, line and column number where the cursor is located, and the system time. It also has indicators for CapsLock and NumLock.

The bottom line gives messages to the user and shows the amount of memory available for more text. As I write, mine shows over 350 Kbytes. The second-last line has a ruler and a cursor indicator, showing margin, tab and cursor positions.

Editing Text

PC-Outline is not just a way of organising notes before writing a document separately on a word processor — it incorporates full editing and formatting capabilities,

allowing the attachment of text to each heading. For example, this column was written using PC-Outline.

The usual word processor block move, delete and copy functions are included, and paragraphs automatically word wrap as text is inserted. The processor defaults to insert mode, moving text to allow space for the newly entered character. A toggle is available to select overtype mode, with the new character replacing the existing character. Strangely this is the CTRL-G key combination — the insert key is used as one way of going from editing to the command menus. Other keys have the more conventional (and expected) uses. A help screen is always available with F1.

Paragraphs may be aligned left, right, centred or justified. An end-of-page marker on the left side of screen indicates the break between pages and is adjusted dynamically as text is entered.

Command Menus

PC-Outline is driven through pull down command menus. Rather strangely, there are three ways of switching from editing to a menu.

The first method is to press the INS key, cursor keys and ENTER to select a first level menu and an option within it. A second method is faster — press the / key followed by the leading letter of the first menu and a code letter for the second. The third method uses the key combination of ALT and the leading letter of the menu to drop it down, the next level being selected as if the menu had been dropped down with the / key.

I think the first and second of these methods should be deleted. In most other software the INS and / keys have standard uses that require very odd keystrokes in PC-Outline.

To speed up operation of some common commands there is a fourth method: some commands can be executed using the CTRL key in combination with various other keys. This, and the use of ALT plus another key are the only *really* necessary methods.

Editing

Once your outline has been created with its headings and the text beneath them, there may be several child levels under each parent level. Initially all text is visible, but if it is desired to see the structure of a document, various combinations of child levels may be hidden, or text may be hidden leaving only the headings visible.

Levels are created using an Outline-Create command and moved with Outline-Move in combination with the up, down, left and right arrow keys to the new location. As it is moved, the first line of adjacent elements can be seen, and the numbering of subsidiary or subsequent levels can be seen to change as the element is relocated. By moving an outline entry to left or right under the Outline-Move sequence, its level is changed — it can become any level from the highest to one lower than its immediate predecessor.

Output

Files may be printed or saved as outline files. A block of text (which could be the whole file) can be exported to any program which reads the keyboard in a well-behaved manner provided PC-Outline is co-resident. The procedure is to start PC-Outline from the DOS command line with the command PCO /r. After starting your other application, pop-up the program with the CTRL-BACKSLASH combination. Load the desired outline, then use the Advanced-Export option.

The block for export is marked and a menu of options pops up (this menu can be modified if desired). On pressing ENTER, you are returned to your host application and PC-Outline injects the block

into your program via the keyboard buffer.

The limited manual on the disc makes no mention of exporting a file direct to a DOS file as either formatted or unformatted ASCII, and there was no such method easily found from the menus or help screen. Here is a simple interpreter BASIC program to do the job —

```
10 CLS:FILES
20 INPUT "Write to which file ";OUTPT$
30 OPEN OUTPT$ FOR OUTPUT AS #1
40 INPT$ = INKEY$: IF INPT$ = "" GOTO 40
50 IF INPT$ = CHR$(27) THEN CLOSE : END
60 PRINT #1, INPT$:
70 IF INPT$ = CHR$(13) THEN PRINT #1, CHR$(10)
80 PRINT INPT$:
90 GOTO 40
```

Just start PC-Outline in resident guise, start BASIC and the program, pop up PC-Outline, mark the block, use the Word-Wrap option and export it to the BASIC program. On completion press ESC to quit that Basic program and return to DOS. Such a procedure should *not* be necessary; export to formatted and unformatted ASCII *should* be an internal function.

Documentation

On disk is the Getting Started section of the full manual — the full manual is sent after registration. While quite adequate for learning the program, along with the menus and help screen, quite obviously

some of the 'bells and whistles' don't get a mention. Still, most of the program is simple and the commands are generally obvious.

Availability

PC-Outline is a user supported product from Brown Bag Software, 2105 South Bascom Ave, Suite 164, Campbell CA 95008 USA. Copying and distribution of the product is encouraged, and users are then asked to register their copy. The registration fee is US\$89.95 plus postage, and for this you receive a printed manual and the latest version.

My review copy of PC-Outline is version 3.22 and has the registration BBS-102086. Along with demonstration outlines and valuable utility programs, it has been assembled into the library program PCO3-22.ARC, length 113,280 bytes. It was downloaded from Bill Bolton's Software Tools bulletin board (2400 and 1200 baud only) on (02) 449 2618. Alternatively, the Sydney PC User Group (Box 5150 GPO, Sydney, 2001) has copies at \$10 plus postage. PCO3-22.ARC can be separated into its components by using ARC.EXE, found on many BBS as the library ARC51.COM.

Despite the shortcomings of the manual on disk and the lack of an internal ASCII export procedure, I recommend PC-Outline to any 'unlucky' writer. □

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'WHAT SOFTWARE SHOULD I get for the kids to help them with their schoolwork?' If I had a dollar for every time I'd been asked this question, I'd almost have to worry about tax avoidance by now.

It's sad that this question has usually been provoked by parents' and students' frustration with the trivial use made of so much computer time in many schools. It's even sadder that many parents still see the computer as a substitute for personal involvement with their children's education. Why should we inflict an educational role on computers that parallels the baby-sitting activities of the TV set?

Still, there really are programs on the box that are thrilling to watch children watch. They come away with their arms reaching out, wanting to tell the first person they corner about all the wonderful new ideas that they've just been seeded with. They rush for their textas, playdough, Lego or anything else that allows them to develop, display and share their ideas. It's enough to make you think that maybe you aren't an altogether hopeless parent and that there's hope for your kids yet!

Shouldn't it be the same with computer programs? When was the last time you saw a child come away full of joy from an 'educational' game, wanting to share their achievements and new insights with you? Certainly not after playing 'Addition Blasta Level 9' or 'Physics Facts Revision #3.' (OK, these aren't real games, but you know the sort I mean: violent, repetitive and above all, *mind-dulling*.) The key to 'success' becomes the ability to predict the next step in these games or to find a way of cheating. Maybe there's a slight increase in 'performance' after a few hours bashing away at the keyboard, but does it transfer to real life? Does it relate to the way things are supposed to be done in school? (*Dare we even ask if the last two are related?*) How often do the kids voluntarily play these games after the first couple of weeks?

Is it too much to ask that computer programs for children, programs that are going to cost you dearly, at least leave your children in a positive and creative frame of mind? Shouldn't they come away from twenty minutes at the keyboard feeling that they've achieved something? Shouldn't they have the opportunity to communicate this achievement with their parents and peers? Shouldn't they have been able to co-operate instead of fight each other? Remember, even competitive

*When was the last time
you saw a child come
away full of joy from an
'educational' game,
wanting to share their
achievements and new
insights with you?
Certainly not after playing
'Addition Blasta Level 9'
or 'Physics Facts Revision
#3.'*

games can turn into co-operative ones when the players share information — look no further than golf if you don't believe me. (I heard one teacher complain that a particular game was useless in the classroom because the students co-operated and performed the task better than those who competed against each other. To my great relief *my* children don't have to go to his school.)

The Problem of Finding Software

A major problem when finding software for use at home is that most good educational software is written to suit the demands of a classroom where one computer is shared between 30 students. This isn't always a blessing as large amounts of planning, resource materials and teacher involvement is required if the package is to work at all well. You'll frequently find that a particular style of classroom is assumed by the designer of a package. 'Dragon World,' for example, is best experienced in a classroom full of dragon paintings, dragon masks, dragon music and dragon books under at least one four-meter long model of a dragon hanging from the ceiling; anything less is an insult to the ideas behind the package.

Programs with only a *specific* content are fine as long as you have a deep pocket. It is not a realistic proposition for even the richest schools to buy software that covers every aspect of the maths curriculum, much less social studies or sciences. What hope does the average parent have?

I have deep suspicions about a parent

prepared to spend up to \$100 on 'a program to help little Sandy with nouns.' An easy way to test parents' motives when they ask the question at the top of this page is to suggest they spend the same amount on books. You'd be saddened by the number of times I've been told in cold tones that they're 'looking for something *educational*.' Alas, not all the machineheads have yet been locked away in computer science faculties.

Better by far to concentrate your spending on packages that are relatively free of content, that open up new ways of thinking, and provide your children with alternatives to other media. You won't find many, but they do exist.

For very young children it's hard to find a better package than 'Podd,' a happy and failure-free character who can do almost, but not quite, everything. It's easy to find a dozen things that Podd can do: the hard part is to find the other 99 or so. (Podd is distributed by Softime Publishing; the software comes with three other programs, Words Words Words, Hide and Seek, and Face, all for \$55 — ring them on (03) 20 8767 to find your local dealer)

It's amazing — the amount of vocabulary extension that takes place in finding out just what Podd can (and can't) do, especially if a personal dictionary or word list is kept handy. Even after children have discovered most of what Podd can do they will be only too glad to show it to friends, relatives, encyclopedia salesmen, meter-readers and anyone else who comes within reach. Why? Because they'll have something they want to share: a bit of excitement and a lot of satisfaction.

Word processors are another example of content-free programs and can help children learn to write well, simply because the best way to learn to write is to write, share your work with others and refine it in the light of their reactions. Any writer will tell you that a word processor's ability to rework text is one of the more liberating tools ever to come their way.

Unfortunately, many adults who 'know everything about computers' will tell you word processors are beasts. Clothed in inane abbreviations and jargon, they block writing rather than enhance it, they say. It's very likely that people with this opinion wouldn't have used any of the second-generation junior word processors that were published for the BBC last year.

For one thing, they're as close to crash-proof as anything can be. There can be few things more heartrending than to see chil-

dren spend hours typing a story, and then switch off the machine without saving. When I first used 'Folio' (\$95 for schools and around \$125 retail from Blakehurst Computer College, (02) 546 7399), I didn't bother to save the rubbish I typed in — 'the quick brown fox' isn't exactly news by now — I just switched off. Imagine the shock of booting the disk the next day and finding the fox still in there, ready to go... that's taking bulletproofing pretty close to the limit.

Folio provides eight clear typefaces, three type sizes and a variety of display and column formats for newspaper, story book or display presentation of your text. Best of all, an adult supervisor can set up a copy of the disk so that any or all of the options are hidden from the user. As competency and confidence increase, more of the options can be revealed to suit the child's ability and needs. The only hardware it won't work on is a printer that isn't Epson-compatible. The documentation is just as well thought out as the software.

Other packages, especially 'Pendown' (from Softime for \$125), are at least as good and have more advanced prompting facilities (prompted writing is a bit of a fad at present in some educational circles) in addition to facilities such as one to design your own typefaces. While pleasantly diverting, I'd be wary of placing too much value on the latter: typography must be one of the most intimidating points of contact between art and technology!

Other content-free tools are available for older children. I reviewed Island Logic's 'Music System' just over a year ago and since then several similar packages have come along. Art packages are limited by the problems of printing the kids' creations unless you're fortunate enough to have a colour printer (though some people are satisfied to leave video art on their VDU screen, probably because it looks best there).

If you've a child who likes programming, there's little to worry about. I've still to see a friendlier BASIC than the Beeb's, and there's Logo, too. I hadn't used Logo for years until I found it tucked away on the Master Compact. After Apple Logo, to have real high resolution colour graphics and a bit of speed thrown in was very exciting and addictive! Why exciting? Because I found it a pleasure to come back to something I'd learned thoroughly (through discovery, not lectures) years

BIG Announcement

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All good things must come to an end. Sad but true.

Carey Smith (our dear editor) is returning from whence he came... to full-time teaching at De La Salle College, Ashfield.

Carey will continue as a part-time Educational Consultant at Blakehurst, though, Newsletters In-Service Courses will still be his domain too.

Blakehurst will continue to give technical support in the BBC area for years to come.



### A NEW BOY

~~~~~

Anthony Passmore is the new recruit at Blakehurst and it will be his job to oversee BBC Sales & assist in the business area. Tony's background is in Sales.

Welcome to Tony and the two part-time secretaries, Jenny & Trish. Two were needed to replace that old war-horse and otherwise good-egg, Lee.

HAPPY YEAR, EVERYONE...

A U-A-S-T RANGE OF SOFTWARE is available for the BBC Micro and the following titles have been found to be excellent!!

PRIMARY

- *Flowers of Crystal - language skills
- *Wordsmith - a junior wordprocessor
- *Dragon World - another great language prog.
- *Story-write a story & create a picture, prints out too.
- *Faces - create Identikit faces on screen and print them out.

SECONDARY

- *View wordprocessor - for the beginner & the expert.
- *Fleet St. Editor - these pages are proof that this is an exceptional program for doing reports or class assignments
- *Speech - allows the BBC to talk aloud & even reads word-processing. Can be included in BASIC.

First B.U.G. Meeting in 1987

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VENUE: Blakehurst Computer College - 847 Princes Hwy Blakehurst NSW

DATE: 5 MARCH 1987

TIME: 7.00pm till 9.00pm

DAY: Thursday Night

COMMENTS: The FIRST THURSDAY in each month is a date to be underlined for B.U.G. meetings! If you would like a BUG meeting to be held at your school this year, contact Blakehurst. Your school gets an AWARD for it!!!

## NEW PRODUCTS ..

~~~~~

There are some terrific programs coming up on the market VERY SOON. They are ...

*ARTROOM

The BBC COMPACT cannot use Fleet Street so the same Software House has made similar package with extra art features and printing options.

*PRINTWORKS

So close to PRINT SHOP this program, & I mean EXACTLY! Does EARNERS and Cards, everything.

Top 2 Games in '86

1. **ELITE** \$39

ELITE is an adventure and trading and arcade-style game. The player buys & sells products to earn Credits to enable them to buy more equipment to help shoot up the space tyrants & pirates. Game positions can be saved.

2. **REVS** \$39

REVS is a VERY realistic 3D racing car simulation. You look through the front windscreen of the race car & need a good time in practice to get a good Grid position for the real RACE!

HINTS & TIPS for Network Users...

~~~~~

Here is a valuable addition to your Network Disks.

Blakehurst Computer College has a NETWORK CONTROLLER DISK now available for \$35.00 that will

- \* Load the one program to ALL stations from ONE computer.
- \* Send messages to ALL stations from any one station.
- \* Clear ALL stations screens in one hit.
- \* Copy files from NFS to DFS and vice-versa.

Folio provides eight clear typefaces, three type sizes, and a variety of display and column formats for newspaper, story book or display presentation.

ago. The addiction came from the fun of sharing each new discovery with other people. I'm sure I bored them silly with my drawings and doodles, but they were just

as polite, tolerant and forgiving of my enthusiasms as a doting parent. It's nice to have people like that around when there's good software to play with. □

HI AND WELCOME to *Your Amiga* column. Here we'll aim to take a look at all that's interesting and available for the Commodore Amiga. Readers who already own an Amiga will have a fair idea of the sensational power of the machine and the rest of you — *hold on to your hats!*

We intend to direct this column to as wide a cross section of Amiga users as possible. We'll have something for everyone, from games freaks to business users, because one of the great attractions of the Amiga is its versatility. Incredible live-action games like Arctic Fox and Marble Madness take on a new life with the Amiga's brilliant colours and stereo sound. Business applications benefit from Amiga's processing speed, ultra fast graphics and comfortable user environment. Everyone benefits from Amiga's excellent value for money and superb open architecture design. (If the author sounds like an enthusiast, you'd better believe it!)

The Amiga is my third personal computer, following on from a TRS-80 (back in the days when 16 Kbyte RAM was big news), and a SpectraVideo 328 (an excellent Z80 machine, sadly left to founder without support in Australia). Before buying my Amiga I searched the stores, read everything I could lay my hands on, and sought advice from anyone I could talk to. In the end the advantages of the Amiga totally overwhelmed the alternatives. Now, after six months of constant use, I'm happier than ever with my choice. I have also been instrumental in introducing Amigas into business environments where I work in the ADP (EDP) training field.

OK, so what makes the Amiga so good? Let's start from the outside. The main processor is housed in a fairly shallow fawn colored box which puts quite a large footprint on your benchtop. But, the box is cunningly designed to allow the big, comfortable keyboard to slide underneath the front when not in use — beautiful protection from dust and spilled coffee. The box also provides a stable base for the Amiga colour monitor, complete with stereo loudspeakers, which sits on top. Without going into *all* the advertising spiel, the total package looks good and fits together well.

The Amiga keyboard is a beauty. It connects to the processor box with a lightweight coiled cable which stretches out to over a meter. The keyboard is low in pro-

file with large, well-spaced and sculptured keys — typing's a pleasure. No RSI worries either as the keys have a good positive feel and require a definite action. A full numeric pad, cursor control keys and 10 function keys complete the unit.

What a pleasant change it was to assemble the Amiga with its serial and parallel printer ports, external disk drive port, modem port, RF, RGB and analog video, and stereo audio sockets all built in —

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*If you want to unleash the impressive sound capabilities of the Amiga be prepared to hook up a stereo amplifier and decent speakers, then hang on to your eardrums.*

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and using industry standard connectors too! It makes hooking up to the outside world quick and hassle free.

The Amiga colour monitor really shows off the enormous range of over 4,000 colours which the Amiga can produce. The image is crisp and stable in all but the highest resolution, interlace mode where it sometimes develops a horrible shudder — more on that subject later. The inbuilt stereo speakers are tiny and really only useful for speech and signal tones. If you want to unleash the impressive sound capabilities of the Amiga be prepared to hook up a stereo amplifier and decent speakers, then hang on to our eardrums.

Finally, the inbuilt disk drive (3.5 inch 880 Kbyte formatted) is whisper quiet and impressively fast. Sadly the same doesn't apply to my external 3.5 inch drive which sounds a bit like a lunatic vitamizer, though it's still 100 per cent reliable. The disk drives have a push-button disk eject mechanism which makes disk changing much easier than most other PCs I have used.

From first switch-on, through six months of heavy use, I have experienced perfect reliability from the Amiga system, and that's a record that's hard to beat.

## How Does It Work?

On initial power-up the box plays a quick, 10 note tune and then requests (by way of a picture on the monitor), that you insert the KICKSTART (system) DISK. After 10 seconds or so the WORKBENCH disk is requested in the same way.

Another 10 seconds passes, and the WORKBENCH screen appears on the monitor in (shades of Commodore) blue and white. You are now living in WORKBENCH-land where you drive around in a two button mouse and use the 'point and press' method of operation, similar to that other MACHINE whose name escapes me. All very user-friendly and polite, and so nice to see over 400 Kbyte of memory still available. The right mouse button is used for pulling down menus while the left one selects icon or whatever (and what a nicely shaped, comfortable mouse it is, too).

There is another working environment available on the Amiga, this is called AmigaDOS or CLI, and herein lies the key to the power of the beast. AmigaDOS rates a brief mention in the owner's manual and that's a lousy joke to play on the proud owner. Unless you fork out another \$40 or so, you won't know how to use AmigaDOS. (Mind you, it could be the best \$40 you ever spent — the manual is well-written and covers all aspects of AmigaDOS).

The Amiga is also provided with its own version of BASIC. For those readers lucky enough to have experienced MSX Basic with its terrific graphics and sound commands — *eat your hearts out*. AmigaBASIC is a superset of MSX Basic and it is just brilliant! Microsoft have really done it right this time. AmigaBASIC is a powerful, functional applications language — forget about line numbers and useless one line condition statements. AmigaBASIC is all you need to produce structured, maintainable, efficient programs — and it's fast too! Now there is no longer reason to write Basic off as a slow mess of spaghetti code.

Let's have a look at some of the software available in Australia for the Amiga. Many of the major software houses took a while to be convinced that the Amiga was going to go, but they are pouring out the products now — and it's nice to see software appearing which makes use of Amiga's particular features, not just portovers of I.M or A...le packages.



### Flight Simulator, too!

Flight Simulator II from SubLOGIC is a knockout. The graphics are fast and smooth, and the engine sound is excellent. Pull-down menus allow selection of flight modes, weather conditions, simulation parameters and even the aircraft type. You have the choice of a Cessna 182, a Gates 25G Learjet, or a WWI biplane with which you can take on the Red Baron and his mates. Locations are centred around the American cities of San Francisco (the default location), Los Angeles, Seattle, Chicago and New York.

It's possible to fly using the mouse only, though I prefer to use a joystick as well: the mouse is used for throttle control and the joystick for aileron/rudder and elevators. It's quite possible to fly under the Oakland Bay bridge and between the World Trade Centre towers — weaving between the buildings of downtown SF can be really invigorating. If you're totally masochistic, you might try a night instrument landing in the Learjet at San Francisco International with a 40 knot crosswind, ground fog, and grade five turbulence. If that doesn't get your pulse racing, you're already dead.

The Amiga version of Flight Simulator II also permits two Amigas to be connected via the modem ports so that two 'pilots' can fly two aircraft in formation or combat. Very clever stuff. On the negative side, I was disappointed to find that after carefully navigating my Learjet over from New York to Niagara Falls there was nothing to see but an unchanging green 'ground.' Similarly, on a flight from LA to SF: once away from LA there is no scenery at all until one arrives in the vicinity of SF. I believe that additional scenery disks covering the whole US continent, Japan and possibly Western Europe are in the offing. The sooner the better. Until then, I'll still have plenty to keep me occupied practising my takeoffs and landings and scaring the daylight out of residents of the taller buildings.

Now to The Cook's favourite game — Marble Madness. This is a real live arcade game which has been ported over to the Amiga with great success. The game, which can be played by one or two players at the same time, involves guiding a marble along various tracks past many and varied obstacles in a race against time. The screen displays are bright and colour-

ful, with beautifully smooth scrolling. Full use is made of the Amiga's sound capability and the descending wail as a marble falls to its doom is truly heart-rending. I particularly enjoy the broom which, with appropriate sweeping sounds, clears up the debris after a marble falls and smashes.

With two players, each trying to guide his marble to the lead, a real battle can ensue. Not enough that the dreaded black marble should try to push you over the edge at every opportunity, but your opponent can also give you a push when you need it least. My only complaint about Marble Madness is the need to start from the beginning after each game. I would like to have the option to concentrate on one screen until I can master it. Other than that I like the game a lot. The problem I have is in getting The Cook away from it long enough for me to do some serious flying, . . . er, computing.

### Deluxe Paint

Now, let's get serious and look at Electronic Arts' dazzling Deluxe Paint and some of the business software currently available.

On the rear of the Amiga processor box is an unassuming little socket labelled 'video.' I discovered that I can connect a length of co-axial cable from this socket to the video input of my video cassette recorder and record graphics produced *a la* Amiga. My video movies now have personalised colourful introductions which I put together with Deluxe Paint.

Deluxe Paint is one of the great things to have happened to the Amiga. Even someone like me, with two left hands and no artistic ability at all, can magically produce spectacular colour images. They may not rank with the artistic wonders of the world, but I feel pretty good about them. Deluxe Paint allows you to draw, doodle and paint in up to 32 different colours. And, you can create an infinite variety of brush shapes or even use a line of text as a brush if you wish. Deluxe Paint seems to be one of those products which becomes more and more useful as time goes by.

With Deluxe Paint you can save your artworks to disk in IFF format and you can load existing pictures from disk. With dozens of excellent pictures in IFF format floating around Australia on Public Domain disks, that gives you the opportunity

to load and then modify to your heart's content and save again. The 60 or so Public Domain pictures I've seen range from photographic quality to primary school standard and there's subject matter to please everyone.

Deluxe Paint has more features than I can possibly describe here so I'll mention only my favourites — defining a few words of text as a brush can give spectacular effects. So does the ability to stretch and bend objects or text and to rotate them to any degree. Colour cycling permits a simple and fast form of animation and can create beautiful, moving effects in scenery. See some of the images on AmigaLib Disks for further examples.

The Magnifying Glass allows you to easily colour and position individual pixels so you can create the finest of detail with ease. The colour palette, which is selected from a pull-down menu, allows you to create the precise tone you want for each of the 32 colours by mixing the amount of Red, Green and Blue in the pot — all 4096 of the Amiga's colours are available. As with most of the better quality Amiga software, the mouse is used for all menu selection and for drawing. After a bit of practice you'll never want to go back to a pencil and paper again.

Deluxe Paint allows you to print your drawings so long as your printer has graphics capability. On a black and white printer, colours are handled according to their grey scale value (brightness). If you are lucky enough to have a colour printer then it's a case of what you see is what you get.

At \$169 (or thereabouts) for the professionally presented package from Electronic Arts, Deluxe Paint is a must for every Amiga owner's collection.

### Public Domain Software

I mentioned Public Domain software and AmigaLib disks above. My friendly local Amiga dealer here in Canberra (Steve's Communications), provides a great service to Amiga owners by distributing Public Domain software and Shareware, most of which originates from bulletin boards in the US.

For anyone who is unfamiliar with the concept, Public Domain software is material which the author decides to share openly with all takers. Usually the author will upload his program to a bulletin

board, along with a statement to the effect that the program is freely available. From the bulletin board, it can be downloaded by individuals who are free to use and share it as they please. At the time of writing, I am aware of about 60 disks full of Public Domain material available in Australia and much of it is excellent stuff, including utilities, games, images, what have you.

Shareware is a slightly different concept. Again the material is made available by the author to be freely distributed, but this time there is an accompanying note asking that anyone who finds the material useful might send the author some money, usually \$5 to \$25. Again it is an excellent means of obtaining some very useful items. I hope that anyone making use of shareware encourages the concept by going to the trouble to reward the author.

## The Music Studio

One of the (many) features of the Amiga is its sound capability; one of the best programs to exploit this capability is The Music Studio, from Activision. I don't pretend to be a musician, but I've managed to put together a few great sounding tunes with Music Studio. From my experience I would say that a competent musician, or even a beginner could achieve excellent results with this package.

The Music Studio uses the mouse to select all its parameters, and for selecting and placing notes and musical symbols on the screen. The program provides 15 instruments and you are able to create more using the full waveform controls available. The capability also exists for you to connect a MIDI instrument, if you're lucky enough to possess one, to your Amiga.

A variety of tunes are already stored. Playing these and experimenting with them will develop your confidence in using The Music Studio. The package is thoroughly documented with a well indexed handbook explaining all the procedures. The disk is copy protected so unless you have means of producing a backup copy for yourself treat the program disk carefully.

On the subject of copy protection, I'm pleased to note that the software manufacturers are starting to see the light and many of the newer products are being

released without protection. For too long now, the honest purchaser of software has been inconvenienced by not being able to make a backup copy of his expensive software. The stupidity of the situation has been that the dishonest person has still been able to obtain illicit copies. For every protection system which was devised, a new pirating technique has been quickly developed. The loser is (as usual), the honest purchaser. If software was retailed unprotected *and* at a reasonable price, the demand for pirate copies, usually without documentation and always without guarantee, would disappear overnight.

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was to assemble the  
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parallel printer ports,  
external disk drive port,  
modem port, RF, RGB  
and analog video, and  
stereo audio sockets all  
built in — and using  
industry standard  
connectors too!*

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## 1-2-3 Alike

For anyone who is still having trouble justifying the purchase of an Amiga, your problems are solved: VIP Technologies in Canada have produced VIP Professional for the Amiga. It's a work alike, look alike, sound alike, taste alike Lotus 1-2-3 but with colour.

VIP Professional is an integrated spreadsheet, database and graphing package which will handle all the business applications you can throw at it. Like 1-2-3, VIP Professional uses keyboard controls only — no mousing about here — and as the keystrokes are identical to 1-2-3's, any of the multitude of books which have been written for that package would be perfectly suitable references for VIP Professional.

A fringe benefit (or debit, depending on your angle) is that with VIP Professional

loaded in a 512 Kbyte Amiga you are left with only a bit more than 60 Kbyte for your data. That's enough for a good sized spreadsheet, but if you're in need of more, a memory upgrade is required. The package will support an Amiga with up to 1 Mbyte of RAM and will handle a spreadsheet with up to 8,192 rows and 256 columns. Now, how can I explain to The Cook that I need 8,000 rows of spreadsheet?

Memory upgrades and things lead on to other hardware items. One of the most frustrating things I've discovered with my Amiga is the need to enter the date and time every time I boot up (or reboot). I've seen a couple of plug-in-real-time clocks advertised in the US magazines but still no sign of one here. By the way, new owners beware. The way in which the Amiga differentiates between files of the same name is on the basis of creation date and time. If you no setee the date/time you no getee the right creation date.

## Why Is It secret?

Every now and then I get downhearted when I am part of a group discussing business micros and only two brands are mentioned — one because of historic ties with the business community, and the other because of excellent marketing tactics. I wonder why the capabilities of the Amiga are being kept such a close secret.

In the corporate training sphere in which I work, the Amiga has proved to be a tremendously valuable tool. High quality images and even animated sequences produced with software like Deluxe Paint, Aegis Draw and Aegis Animator can be incorporated into training videotapes. Programs like DPSlide — written by Electronic Arts and released into the public domain — can provide very effective visual presentations, especially with the Amiga tied to a Sony 63 cm monitor. Colourful graphs and project analysis charts are easily and quickly produced for printing or direct display as the occasion determines.

Already the Sidecar has provided business users with the power and compatibility of the IBM PC combined with the speed, flexibility and multi-processing capability of the Amiga. If the new desktop publishing software is as good as I've been lead to believe, then the Amiga will be set to take a healthy share of the business PC market. □





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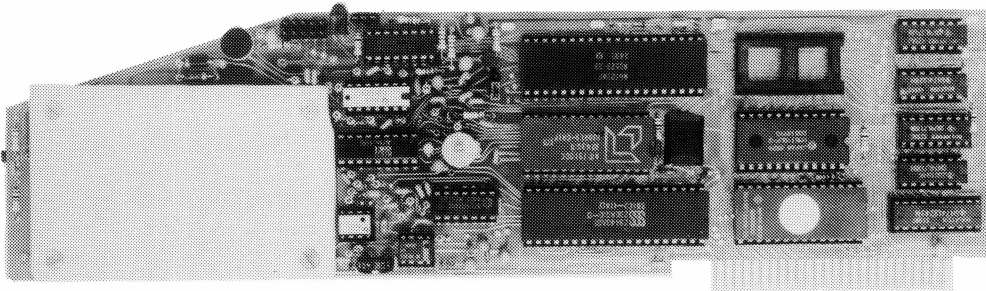
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\* Super intelligent direct connect MODEM/VIATEL terminal for APPLE II, IIE & compatibles fully contained on a single card — plugs into slot#2 — does not require separate serial card or software. All software is permanently resident in an onboard 128K EPROM. It is hidden in the slot#2 card space, leaving the whole of memory completely free for other programs unlike disk based comms software which must occupy the main memory excluding other programs. It is menu driven and automatically senses for ProDos or DOS 3.3 operation. Received files are appropriately converted before saving and can be used.

Sending/receiving files is very simple:—

- Press "ESC" to display menu.
- Select "(S) END A FILE" option
- Answer the prompt "FILENAME?:"

The modem will search the disk for the file, make all the decisions (e.g. binary, basic, textfile, DOS 3.3 or ProDos) and transmit it in the correct format. <CR> transmits the file in memory. Similarly to receive a file select "(R) RECEIVE A FILE" option.

\* AUTO ANSWER — AUTO DIAL. Senses true dial tone, ring tone, busy tone and acts intelligently, returning status messages. Characters can be included in the phone number to set baudrate, pause, "await dialtone" and multiple redial on busy. On answer, it selects the incoming baudrate by precision frequency measurement. This is much more reliable than the normal autosearch using carrier detect which is often confused by voice and phone tones. A reliable autosearch is a must for bulletin board operation.

\* 300 Baud full duplex or 1200/75 and 75/1200 with fast automatic line turnaround. An upgrade kit to add V22 (1200/1200 baud) and V22 Bis (2400/2400 baud) will be available later.

\* Main menu option "(V)IDEOTEXT" shows the VIATEL menu. It becomes a full graphics VIATEL terminal, automatically dialling and transmitting the user ID stored in the battery backed ram. When online, a keypress will immediately save pictures to memory. These can be reviewed later and selectively saved to disk or printed (requires a graphics printer card). Pictures can be loaded from disk and printed out. The modem can act as a videotext host and can be programmed to act on frame information. e.g. — use the clock to ring "MONEYWATCH" hurly and dial you at the office if your shares move outside a given range.

\* TELESOFTWARE DOWNLOAD facility to purchase programs over VIATEL from suppliers such as MICROTUX 666 and TANGO.

\* A full wordprocessor in EPROM for pre-composition of text before transmission. It can also be used to edit or print received files as well as for general wordprocessing.

\* Onboard battery backed calendar clock can time and initiate calls or keep an activity log. ProDos uses it to time and date disk files and it is accessible from Basic.

\* 2Kx8 battery powered CMOS RAM stores default parameters, phone numbers, ID, password, logon strings, search codes and setup parameters (e.g. baud rate, parity, printer ON) for each number, allowing single keystroke call establishment to specific areas of complex databases. Main menu option "(T)ELELIST" displays the list of 23 names and one is selected.

\* Incorporates XON/XOFF and CHRISTENSEN error correcting protocol. Textfiles are not so fussy but error correction is a must when transferring program files. A debug function can display normally invisible control characters sent by the host.

\* Can output directly to printer even when online at 1200 Baud — a fast printer is not required as the printer is spooled out of the receive buffer. A "FILTER" function is available to remove screen control characters from textfiles (these can drive a printer crazy). Special scroll routines print to 80 column screen and printer at 1200 Baud without any lost characters.

\* Unique "PHANTOM MODEM MODE" function allows the modem to be permanently connected with the normal phone. When answering, if it doesn't immediately detect a calling modem it generates ringing tone back to the calling party and sounds the APPLE bell, giving you 60 seconds to answer the phone.

\* If you have previously purchased this modem and have not yet received an updated EPROM VERSION V2.18 and a manual, contact AUTOMATIC ICE CO. — there is no charge for these.

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FOR ALL ITS MERITS, the C-64 has two big problems. This first is the limited V.2. BASIC, a language that does not support any of the graphic and sound capabilities of the computer. The second is the painfully slow CBM serial bus and consequent disk drive I/O speeds.

Unless you are a programmer, the first problem is not as bad as it sounds. In the old days, almost every computer owner wrote software of one form or another, but as the software pool has grown there is now less and less need to do so. In other words, programmers are a declining percentage of C-64 users. These days you can buy off-the-shelf software to do almost anything, and most of it has been written in machine language and so avoids the limits of BASIC. On the other hand, if you do happen to write your own programs, you now at least have the option of spending a little more and acquiring a C-128 with its better BASIC.

It is a different story with the disk I/O speed problem. That is a direct result of the hardware/firmware configuration of both the computer and the disk drive. The Commodore 64 was designed as a home computer at a time when disk drives were still quite expensive items. The emphasis was placed on packing in as many features as possible at the lowest conceivable price. We ended up with superb graphics and sound and a very flexible computer. Unfortunately, one of the shortcuts taken was to employ simple (and slow) communications with peripherals.

Commodore chose to use 'smart' peripherals linked together in a daisy-chain arrangement via a serial bus. It seems a sound approach — there is nothing wrong with having 'smart' peripherals: they use up none of the host's memory and can be told to do things while the computer gets on with other business. There is also no real problem with daisy-chaining peripherals together. Daisy-chaining simply means that the peripherals are connected like beads on a string, with only one end of the string connected to the host computer. The same principle is employed in many Local Area Networks where the nodes (beads) are computers instead of peripherals. It makes for far simpler wiring than the alternative which is a star system with each node directly linked to the host.

The big problem with disk speed originates in the third element, the CBM serial bus. Think of the bus as the string that connects the beads, only in this case the

*Despite the qualifications I'm very impressed with Dolphin DOS — I even bought one myself. In terms of performance and flexibility, it's easily the best of the hot-up systems available. It turns the 1541 into a real disk drive.*

string consists of just one strand and can carry only one bit of information at a time. This means that when the computer wants to send one 8-bit byte of information to the drive, it has to go through more than eight steps because there is a certain amount of handshaking going on. Handshaking is worth a little explaining because it is almost always involved when computers communicate.

Essentially, what happens is that after eight bits have been sent, the receiver says 'Righto, I've got eight — send me some more' and then sends back a bit that means 'yes'. The sender gets the 'yes' bit and returns a bit saying 'Good oh, here comes another eight,' pauses a microsecond or two and starts sending the eight bits one at a time. Of course the whole process gets a little more complex if the messages are 'no' instead of 'yes,' but the point is that handshaking creates an overhead of at least two extra bits going around, and sometimes more.

Two bits may not seem much, but remember that's two extra for *every eight*: a 25 per cent minimum overhead. (Modems are serial devices and they have the same problem — 300 baud should equal  $300/8 = 37.5$  8-bit characters per second. In practice they receive 30, because each byte takes 10 bits not 8).

There is a way to speed up things and that is to use a parallel bus instead of a serial one. A parallel bus has eight or more strands to its 'string' and can send an eight-bit byte in one step, each wire carrying one of the bits. This is the method other computer manufacturers use and is part of the reason why their drives are so much faster.

Commodore have had the same serial bus system since the VIC-20 days. It was logical to include it on the C-64 since it meant that all existing peripherals would still be compatible with the new model. They have even kept it on the C-128, but have exploited an unused pin to enable the 1571 and 128 to activate faster handshaking and communication protocols. These new protocols were not added to the new C-64C on the grounds that compatibility must be maintained.

Well, compatibility is a bit like motherhood. No one is going to argue about the need for it, but compatibility doesn't mean that there can't be improvements. With the 128 and 1571 drives, Commodore have shown that with a little creativity you can keep your compatibility and still make improvements. You simply create systems that can operate in several modes. True, the 1571 is not 100 per cent compatible with the 1541 — but it could have been if they had employed the same switching system that they used for the 128/64 mode transition. If you can make two or three different computers coexist in the same box, surely you can make disk speed improvements compatible as well.

### Dolphin DOS

I have on my desk a C-64 and 1541 that can operate with either the standard serial bus or, at the flick of a switch, with a full parallel bus. The speed advantages of the parallel bus are incredible, with almost any unprotected Basic program loading in less than six seconds! (And that is without any screen blanking). The speed advantages also apply when saving programs (usually under 11 seconds) and there are marked read/write speed improvement with sequential and relative files as well.

Dolphin DOS is a hardware/firmware modification to both the 1541 and the 64. Both units keep their I/O ROM chips, but they are wired piggyback fashion with add on circuitry that supports the parallel bus feature. Both units can have the fast mode features switched out, thus returning the entire system to the standard mode. As it stands, Dolphin DOS in parallel mode will load the vast majority of commercial programs in lightning quick time with no screen blanking. The manufacturer claims that programs load 25 times faster than normal and my testing confirmed that — with a few exceptions. The speed increase is brought about by a combination of the parallel bus and high speed loading soft-

ware. The fast loading itself is nothing new — there are a number of cartridges and ROM chip accessories available that offer 7 to 8 times speed advantages, but Dolphin DOS has that *plus* the advantages of a parallel bus. Hence the dramatic speed differences and they apply to writing as well as to reading times.

When I first got this system running I was ecstatic. I tried it out on the SSG strategy game, 'Carriers at War'. This is an excellent game (I like that sort of thing), but it requires disk access for every move. It typically took 50 seconds to get to the command menu and another 50 seconds to return to play mode. With Dolphin DOS these times were reduced to less than 5 seconds! The game suddenly took on a whole new dimension of playability.

But the magic has its limits. Some commercial programs employ relative files and funny load methods as part of their protection. These can slow the load down. 'Easyscript' usually takes 65 seconds; with Dolphin DOS, I could manage only 15 seconds; 'Flight Simulator' loads in 2 minutes 11 seconds, instead of 2 minutes 54; 'RAMBO' won't load at all — you need to go back to standard mode for it. Mind you, I am talking about original disks. If I Freeze Frame them and then try loading with D-DOS they all take less than 10 seconds. But Freeze Frame is no use with programs like 'Superbase.' I was hoping that D-DOS would speed up its disk performance — it certainly loads faster,

but when it comes to reading or writing files the improvement was only marginal.

Dolphin DOS comes with a number of other features as well. It has a built in M.L. monitor, a built-in DOS command set like DOS WEDGE, and it has pre-programmed commands for the function keys which are quite useful — these include directory, list, list to printer, load, 8,1 and save. The shift/run/stop key will automatically load and run the first program on a disk, and the save and replace bug has been eliminated. There are also enhanced commands for the screen editor including an option which will dump a copy of a low-resolution screen to a printer.

Dolphin DOS supports a Centronic printer, provided it is device four. I don't know why they bothered with that — who uses them anyway? However it doesn't seem to affect a CBM printer when it is device four; Easyscript worked perfectly, although I did find that with the PAL assembler the printer slowed to a snail's pace. I'm not sure why that happened, but it could be some quirk in the PAL program. The only other catch is that D-DOS plugs into the user port and does not support the RS-232 interface, which means you can't use it for modem applications.

Despite the above qualifications I'm very impressed with Dolphin DOS — I even bought one myself. In terms of performance and flexibility, it's easily the best of the hot-up systems available. It turns the 1541 into a *real* disk drive. It be-

comes much, much faster than a 1571 and if something doesn't work with D-DOS, you can always switch it out and revert to normal. It is the sort of product that Commodore should be endorsing and distributing themselves. Its switchable compatibility and powerful performance would definitely extend the 64/128 range into new markets. At the very least, CBM endorsement would lead to the development of a whole new genre of disk based software. (Wishful thinking would see CBM buy the licence and include it with all 64/128 computers and peripherals).

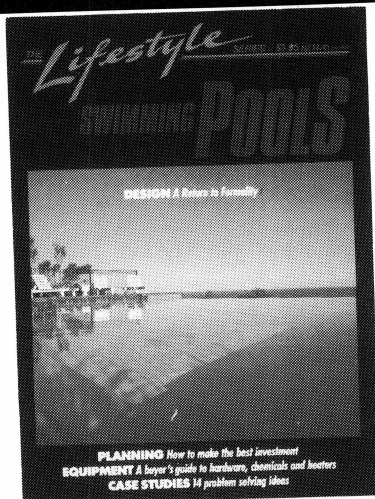
Dolphin DOS costs \$169.00, which sounds a lot, but it's not when you consider what you've already outlaid on your system. A 64, monitor, 1541 and printer is worth over \$1000. An extra 15 per cent seems a small price to pay for the performance it brings. *No more waiting for programs to load!*

D-DOS is not difficult to fit. At the 1541 end, it is simply a matter of pulling out two chips and inserting a module in their empty sockets. The C64 end requires the replacement of the Kernel chip. On 64's that are younger than about two years this will involve desoldering. Don't attempt this unless you are electronically competent. Budget an extra \$30.00 and get an expert to do it for you.

If all that sounds interesting, you can find out more from Micro Accessories, Unit 8, Hewittson Road, Elizabeth West 5114 SA; telephone: (08) 287 0191. □

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*The SUBMIT file is a simple text file that mimics the keys that the operator would type to execute the commands, with the one difference that control characters are entered as a carat followed by the character.*

---

### Wordstar and Bondwell

THE SUBMIT UTILITY supplied with CP/M 3 is a significant improvement over the version available with earlier releases of CP/M. SUBMIT is usually used to allow automatic execution of a series of commands that would otherwise be entered by the operator from the keyboard, but prior to CP/M 3 the only commands that could be executed were those that would be entered in response to the system prompt — A> or B>. The version of SUBMIT supplied with CP/M 3 on the Bondwell has been enhanced to allow automatic input of data into a program.

To demonstrate this facility, I will develop an automatic update procedure for Wordstar header files. A common practice for those using Wordstar in an office environment is to establish a number of proforma documents. These are sometimes referred to as header files, and typical examples might be LETTER.HDR for letter, NOTE.HDR for notes and MEMO.HDR for memos. When such a file is written the header file is read in (⌘KR) and the document is completed by 'filling in the blanks.' These headers can contain ruler line and print format commands as well as text, so the time saving and increase in consistency can be considerable.

### Headers

In this example I will assume that the header files include today's date, and the first task each morning is to adjust the date in each of the headers. This can be automated using the data input facility of SUBMIT.

In order for the SUBMIT facility to distinguish between system commands and program input, an indicator is used at the

beginning of each program input line. This indicator is '<', and is necessary because the program might demand more input than has been included in the SUBMIT file.

If SUBMIT encounters a line that does not start with '<' it does not feed any more lines to the program but falls back to keyboard input until the program ends. This makes it possible to use a SUBMIT file to start a program, issue a few initialization commands and then revert to keyboard operation. When the operator exits from the program the SUBMIT file is still active, and will execute any remaining system commands.

In this example the SUBMIT file, called UPDATE.SUB, will start Wordstar, load each header file in turn, search for the date, replace it with the new date, and save the file back to disk. When all three files have been updated, the operator can continue with any other editing. When Wordstar is exited, the SUBMIT file will then delete any .BAK files on the B: disk. (This last step is not good practice, but is used here to demonstrate that the SUBMIT file is still active after it has finished feeding the program the data input lines).

Notice the format of the Wordstar commands in the SUBMIT file. Whenever a control character is required — Ctrl-Q, for instance — it is entered in the input line as '^Q' (carat followed by the letter 'Q'). This is equivalent to the way Wordstar displays control characters as they are entered. Thus, the SUBMIT file is a simple text file that mimics the keys that the operator would type to execute the commands, with the one difference that control characters are entered as a carat followed by the character.

However, in order to enter the dollar symbol in a SUBMIT file it must be entered twice. This is because the dollar symbol is used by SUBMIT to indicate command line parameter substitution. For the same reason, if the carat symbol is required in the input line — other than as an indicator of a control character — then it must be repeated, for example '^'^'

### Substitution

Command line parameter substitution? This is the fancy term for the way variable data is entered into a SUBMIT file, and is used in the example. Notice the '\$1' and the '\$2' lines: these should be read as 'replace this symbol with the first (or second) word (after the SUBMIT file name) typed by the operator when the SUBMIT

command was entered from the keyboard.' In the example, these two words will be the date to replace and the date to replace it with, respectively.

Therefore, the command to invoke this sample SUBMIT file is SUBMIT UPDATE 12/3/87 13/3/87<RETURN>. This causes the symbol '\$1' to be replaced with '12/3/87' and '\$2' to be replaced with '13/3/87.' Then Wordstar is started, each file updated as required, and control returned to the operator.

I have included the 'H0' command at the beginning, and a 'H2' command at the end, as the procedure operates much more quickly if menus are suppressed. Wordstar commands have been entered as capitals, with data in lower case so that

SUBMIT data file - UPDATE.SUB

```
ws
<H0
<Db:letter.hdr
<^QA$1
<$2
<N
<^KD
<Db:memo.hdr
<^QA$1
<$2
<N
<^KD
<Db:note.hdr
<^QA$1
<$2
<N
<^KD
<H2
era b:*.bak
<Y
```

the two types of input can be distinguished. Each line is ended at the point that the operator would type a <RETURN>. Note that Wordstar does not require that the second character of a two-key command be a control character. Thus, ^Q^A, ^QA and ^Qa are all equivalent.

To test the procedure create the three named files with the same format appearing somewhere in each file. Then create UPDATE.SUB precisely as listed here — non document mode is safest for a 'data' file like this. Get UPDATE.SUB, SUBMIT.COM and Wordstar onto the A disk, with the header files on B. At the A> prompt type SUBMIT UPDATE <old date> <RETURN> and sit back to watch the action. This is only a trivial (albeit useful) example, it demonstrates the possibilities serious SUBMIT users can come up with. □

## Memory Resident Programs

MEMORY-RESIDENT UTILITIES seem to be all the craze. The Mac world, where the craze started, is becoming swamped with these utilities which sit behind your basic program/s and spring into life on command. There's now an extensive Mac software industry devoted exclusively to desktop accessories.

But Apple have held a tight grip on the Macintosh standards, and they designed the machine with RAM-resident utilities in mind. So it has been easy for the Mac.

In the MS/PC-DOS world, the IBM PC and clones are beginning to run into serious problems with these programs. No one has yet managed to set standards, so often two or more RAM-resident programs can clash causing all sorts of problems.

Pinpoint, a series of modular background utilities which provides a good communications program, a bad spelling checker and miscellaneous trivia to 'enhance' AppleWorks, is activated by pressing <Closed Apple>-P. MacroWorks from Beagle Brothers (which allows you to add macro commands to the program) uses these same commands — which is just one of the reasons why you can't have both behind AppleWorks at the same time.

This is a pity, because I want the Pinpoint communications program together with Beagle's macro ability and a few other accessories like a decent diary and alarm system, but I don't want to waste RAM with modules that I don't need. For this reason I'm constantly on the hunt for a background utility that provides me with what I want in modular form — it should allow me to customise AppleWorks the way I want it to be.

These modules don't all need to be RAM-resident in the strict sense of the term, incidentally. Pinpoint itself is RAM-resident, but it accesses a disk (or a RAM-disk) to get the called module when needed. The key to the whole system, it seems to me, is that everything should be modular so that I can construct the integrated program that I need.

## Lusting After AutoWorks

A couple of months ago when I first heard of AutoWorks (Software Touch, San Diego, USA), I lusted after it because it was said to provide AppleWorks with a true mail-merge function. And it does. It has a good

mail-merge module that allows you to use a form letter with numeric codes (#1 for firstname, #2 for lastname and so on) and have these automatically substituted, in order, from a database file.

Of course in the interim, AppleWorks 2.00 has appeared with its own excellent mail-merge function, so this side of AutoWorks is now relatively superfluous.

The third useful feature is that of providing macros for the creation of special commands within AppleWorks. Whenever you are involved in repetitive typing — either for character input or in providing formatting controls — you can create a macro which can then be called by a <Closed Apple> command.

Software Touch have supplied about 50 ready-made macros which you can choose to keep, or replace and supplement with any of your own. In case you are worried about running out of keyboard space with your macro selections, AutoWorks allows the use of <Closed Apple> plus two keys to extend the range possible.

This strikes me as a bit of overkill, but it is often easier to remember two-letter mnemonics (for instance 'AD' for address) rather than single letters. Two of the supplied macros give AppleWorks a true delete and undelete. They allow you to move blocks of text automatically to the clipboard so that they can be brought back from the dead if you later change your mind.

To me, the most useful function on AutoWorks is the Read Disk option that reads the directory of any ProDOS disk into an AppleWorks word-processing or database file. It means that you can catalog your disks relatively easily and have a cumulative catalog constantly at hand in the form of a database file.

This catalog has proven to be an absolute godsend to me because I've got a couple of hundred data disks filled with every letter and article I've written over the last few years. Without some form of cumulative catalog I can't ever find the article I want.

So much for computerisation — but slowly we're getting there! I think AutoWorks is almost the answer. But it is certainly not the whole answer — for me.

## Co-operation

I know it's a bit much to ask companies to co-operate, but we really need some

standards in memory-resident programs so that we can add the modules we need to customise our own basic software. I guess it's too late with AppleWorks now because so many incompatible accessories are already on the market, but Pinpoint looks as if it will dominate this field anyway, so perhaps we already have a de-facto standard.

Pinpoint fortunately has taken the modular path and it has a tool kit available which aims to help other programmers write their own utilities for the system. They now have on release a Key-Player module (US\$49) which lets you create macros, and InforMerge their mail merge program.

I also notice that the tortoise-like Spelling Checker had been supplemented by Document Checker which they claim is 'the fastest AppleWorks spelling checker available.' It has a claimed rate of 30 to 150 words per second.

This last item doesn't seem to be a background accessory to AppleWorks, but rather a separate spelling checker *a la* Sensible Speller, and it quite likely suffers all the problems of the other external checking programs on the market.

I'd also take the company's speed claims with more than a grain of salt; they claimed that the Spelling Checker module was 'lightning fast!' Even 150 words a minute isn't fast enough if it takes you 10 minutes to down-load and reload files — from and then back into — AppleWorks. With external programs like this, it is the time-overheads that create the problems, not the speed of checking.

Pinpoint are about to release their own version of the Mouse Desk/Catalyst-type program selectors. It's called RunRun (from Pinpoint Publishing, Emeryville California, priced at US\$49) and it displays ProDOS files in a Macintosh-like desktop with expandable, movable windows — but it doesn't use icons.

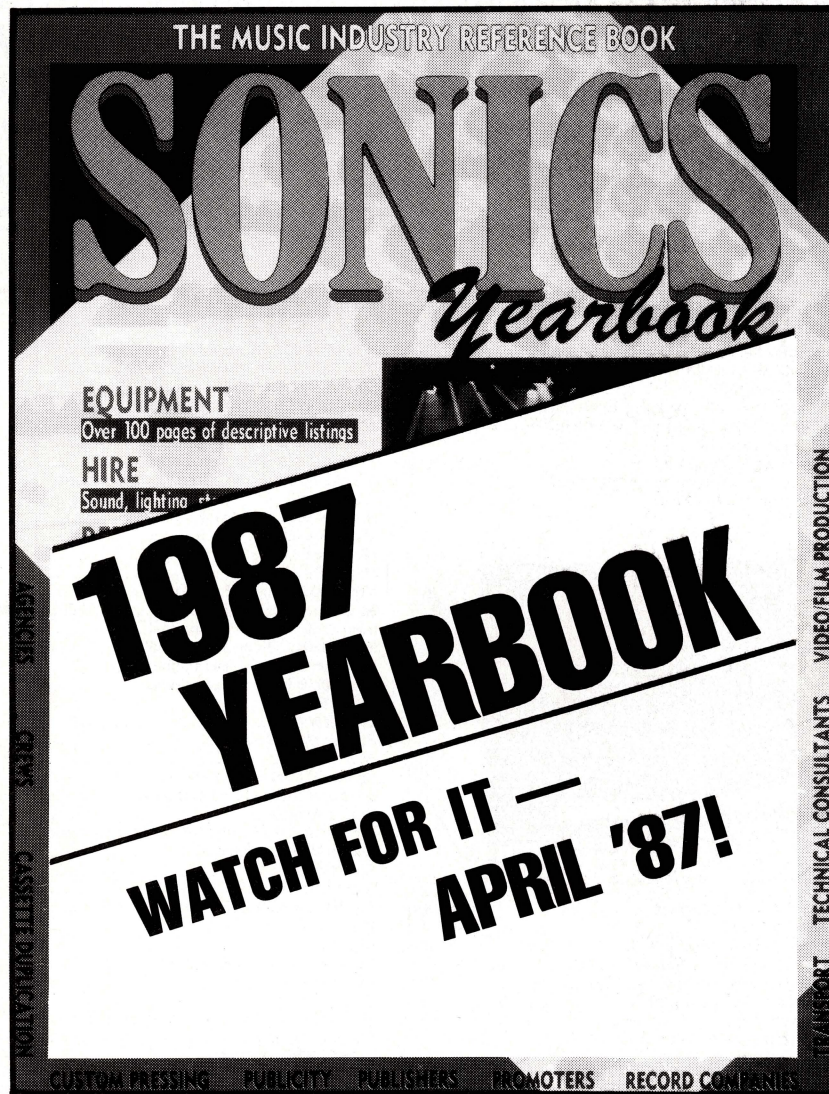
RunRun doesn't let you use a mouse, and the prototype lacks file and disk copying capability, and it can't format a disk? So what does it do?

Good question! It seems to be aimed directly at Pinpoint Desktop Accessory users. Apparently it enables you to run one accessory from within another. If you've got Pinpoint's notepad open, and you want to use the calculator, you can... *ho humm*. □



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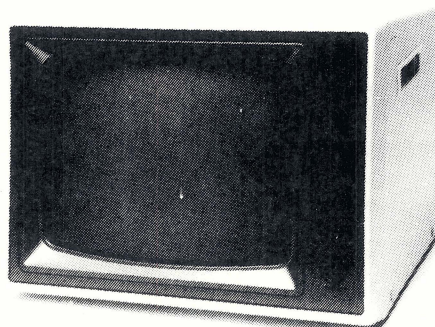
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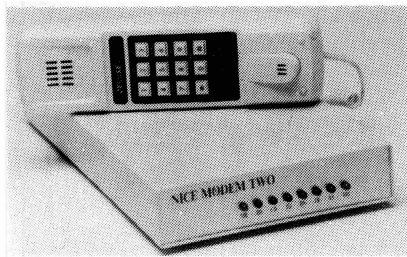
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## The Kidron Laser Octave

SIGMA DATA HAVE ANNOUNCED that they are now distributing the Kidron Laser Octave Office Publishing System. According to Sigma Data, this product is *not* aimed at the Macintosh type of desktop publisher but more at enhancing documents produced in the office for internal or client use.

So, it is *not* a desktop system, although it's not clear to me what the distinction is. Anyhow, it is designed to enhance your existing software. It's specially set up for the most popular software such as Wordstar and Multimate, 1-2-3 and Symphony, but can deal with any program that can output an ASCII file. It can use any laser printer. It consists of a Printelect hardware box — same width and depth as the IBM PC but not nearly as tall — and HiLite software.

Personally, I don't care if I never see another PC publishing system, but I must admit this system has some interesting claims. It supports kerning, can handle up to 120 fonts per page, and allows the printer to run at its rated speed. It works off what Sigma Data call pop-up. They also used two pronunciations of 'Octave,' both of which were different to common usage, and have conceived the horrible term *kidronize* to refer to the process of putting a document through the Kidron system. I'd never buy a product from someone who murders the English language like this; it makes me all the more conscious of the comments that have been made about the ease with which you can now turn out impeccably prepared documents full of junk.

One possible problem is that the laser printer's controller board is disabled when the system is installed.

The Kidron Laser Octave Office Publishing System sells for \$8,450 plus tax, which brings it up to about \$9,500, but this includes a laser printer (8 pages per minute). If you already have a laser printer, expect to pay about \$5,500.

## Symphony Release 1.2

This is an update to Release 1.1. It incorporates those features previously introduced in Lotus 1-2-3 Release 2.01. The main differences from Release 1.0 are —

□ Support of additional memory above the standard 640 Kbytes (this requires an additional memory board compatible with

*In a letter from Imagineering about the Symphony update, this sentence appeared: 'Lotus upgrade their products to uphold their commitment to you to provide the highest quality PC software available'. For Australia, they should add 'at the highest price'.*

the MIL expanded memory specification);

□ Sparse memory management for more efficient memory usage;

□ Support of 8087/80287 math coprocessors;

□ Macro Library Manager to create macros for use with any Symphony worksheet;

□ Data transfer to and from Symphony and Lotus 1-2-3 Releases 1A and 2;

□ Features claimed to simplify learning and day-to-day use.

The main differences from Release 1.1 —

□ Hard disk installation without the use of a floppy disk, using the same iniquitous copy protection system as 1-2-3 Release 2.01;

□ Statistical analysis add-ins;

□ Matrix manipulation and linear regression analysis;

□ Range Input add-in;

□ New communications protocols — BLAST and 'B' (Compuserve);

□ Remote file access and printer sharing on the IBM Personal Computer Network;

□ Data transfer to and from dBASE III.

In the US, registered owners of Symphony Release 1.1 receive the upgrade free. Owners of Releases 1 and 1.01 have to pay \$75. In Australia, registered owners of Release 1.1 paid \$90 plus \$6 freight (this upgrade offer has now been withdrawn). Australian owners of Release 1

and 1.01 pay \$180 plus \$6 freight plus sales tax. The other upgrade that is still available is for 1-2-3 from Release 1A to 2.01. This will cost you \$250 plus freight — presumably also \$6 — and sales tax.

In a letter from Imagineering about the Symphony update, this sentence appeared: 'Lotus upgrade their products to uphold their commitment to you to provide the highest quality PC software available'. For Australian, consumption they should add the words 'at the highest price'.

By the time you read this, Imagineering should have released four new Lotus products. These are HAL, a natural language add-in (US\$175; A\$334 including tax); Freelance Plus, a graphics program; Measure, for real-time data acquisition into 1-2-3; and Manuscript, a word processor for technical writing (US\$495).

HAL is a memory-resident program for use with 1-2-3 (1A, 2, 2.01). It allows you to enter many instructions in English, rather than using the slash commands and also to carry out additional operations, such as linking worksheets. One feature that will prove popular with people like me is an UNDO command, which will enable you to recover from your last mistake. (See the May issue for my detailed review of HAL.)

Measure acquires data and stores it in a 1-2-3 spreadsheet using the normal menus and additional macros. Data is then available for analysis and graphic display. You can control GPIB devices, RS-232C instruments, A/D and D/A plug-in boards.

Manuscript is designed mainly for scientists and engineers. It contains an outline processor which allows you to make global changes to a document, such as changing the type style of all sub-headings. You can incorporate text and graphics into one document and enter complicated mathematical formulae, although these will not appear on the screen as they will print out.

Moving sections around is said to be very fast, because the program switches pointers to each section, rather than move it physically. You can output a document to the customary laser printers, and even to a device with a Postscript interpreter such as Apple's Laserwriter. You cannot, however, enter Postscript commands directly nor can you use kerning. □



*HI! You Microbee users out there. Send me your ideas, programs, newsletters, anything of interest to other Microbee users. Without your support I will soon run out of new ideas. I know there is quite a lot of Microbee software (for sale or free) out there that I (and thousands of others) don't know about, so drop me a line c/o Your Computer.*

THERE IS ONE severe limitation of this column (and of most published features, for that matter): an article may be written up to three months before it appears in print (although four to six weeks is usual). So, apologies to Michael Kruse — the memory surcharging surgeon from Adelaide. Your phone number was correct when I wrote the piece. Michael tells me he is now best contacted via the Microbee Shop in Adelaide.

#### Public Domain

I recently raided around the Bulletin boards to see what new public domain software was about. I found what was on first sight an excellent, menu-driven, easy to use and fast address book program by E Reaburn, dated 17 February 1986. The only trouble was that when I tried to save the first address I put onto it, I got 'Runtime error 91, Pc = 2ca6'.

I then found an excellent (at first glance) CALC.COM (N Strassner v4.1 1985) program that allowed all sorts of calculations even with logical expressions like OR and XOR (not that I use such things) — only to find that the only calculations were in whole numbers. Ten divided by three equalled three!

The third time I struck lucky! I had a look at Findu.Com. Now similar programs travel under several aliases such as Find+.com, Fynde.com and simply Find-

Com. It doesn't always even have the same size. Fynde, the fullest menu driven form, is 6 Kbyte in length. There is also a 4 Kbyte form and a good little 2 Kbyte program — neither of these have Fynde's good starting off menu, though.

I have on my work disk a little old 2 Kbyte form that carries the date 3rd of August 1982. This will search Microbee's M:drive RAM disk, no worries. It will search files specified with wildcards. It handles Wordstar files without a groan and it is very fast. It will list all its finds by line number and file name. It will search any files you specify for any word, numerical sequence or string.

But it will not allow you to use the ? wildcard in the files it searches (The ? wildcard is used to replace any letter — thus Beat, Heat and Peat could all be searched for with ?eat).

Findu.Com is even more powerful — it will search squeezed files and unsqueezed files without batting an electronic eyelid! It won't even notice the difference! If you tell it to, it will also search files in Libraries (collections of files tightly bound under one name).

The word or string you search for can also contain certain wildcards. X{?} will find expressions like X100 and X23. S Krugar has written a document file for the 1.2 version of Findu.Com, dated 27th May 1986. He says it is an upgrade to the Find-40.Com that was previously around.

Krugar says it searches for any string up to 79 characters long or the length of the command line, whichever is shorter. You can have spaces in the string. Thus it will search for a series of words like 'all light globes over 100 watts.' I haven't tested my little old 2 Kbyte find.com, but I know it will search for at least two words, it may well do a whole line.

However it has two flaws: it doesn't give line numbers — just file names (at least, I haven't located a command that makes it do this) and this can be a real menace; worst of all, it does *not* find all instances of strings. I just told it to search all my \*.bak files for all lines containing 'Microbee.' It only found one.

I told my sweet old 2 Kbyte program to do the same search — it found 5 'Microbees' in four files!!! This damns Findu.-Com in my eyes.

Now for the 6 Kbyte version called Fynde.Com. My copy of this is dated 5th July 1985 — and the revolutionary credit is given to the 'Universidad Autonoma de Puebla'.

When you call it up by name it comes up fast with a very useful looking initial menu. This menu tells you to type H for more Help, S for files to be searched, D for write results to disk, P for a search pattern and Q to 'quit decorously'. It warns you that if you do not observe the Q for Quit you may not be able to save the results of the search.

Now it can do an excellent job of searching, listing the line numbers for all the lines it finds containing the requested word or string as well file names, like the little 2 Kbyte program and unlike Findu.-Com it will list, giving the line number and file name.

But I am not at all sure about it's one great advantage — the ability it claims to be able to automatically write this information to a disk file. I tried to do it three times — all I got was a jumbled name on disk for a blank file, so I'm not sure yet quite what happened.

It also does not like Microbee's M:Drive. BE WARNED! It made my machine crash out whenever I told it to search the M:drive, even when it was sitting in that drive. Every time it came up with 'CPM ERROR on C: SELECT.'

I also had this happen one time when I used the start-off menu in what could be the wrong order. It worked fine when you type S \*.DOC for example and then P MICRO?EE. But when I typed D for Disk file after the S command and before the P, it crashed.

Having said all this — Fynde does allow a comprehensive search of an A: or B: drive disk for words or patterns using wildcards: so if you forget about saving the results to disk until you have worked out how it works, and if you don't use the M:drive for searches, you may find this the most useful of the three programs if you must search for strings containing wildcards. I have not tried to search squeezed files with it.

But for me, Small once more is Beautiful. My little 2 Kbyte Find.Com will stay on my working Wordstar program disk.

Just a final hint for new Microbee 128 Kbyte users. If you have to survey a few disks, put Transfer.Com in your M:drive. It boots with extreme speed *and* it allows you to swap between drives by simply typing A or B or M or L and pressing return. It's the fastest way to boot disks that I know.

See you next month and don't forget to drop me a line if you have anything worthwhile for other users. □

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Apple IIc System — hardware: Apple IIc computer, Apple monitor and stand, Apple printer, mouse package, joystick; software: 75 disks (161 programs) valued at \$4,500 (business, scientific, languages, educational, games, home use); 25 books and manuals. Selling for \$3,200 ono; Michael (02) 667 1958.

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## AMUA:

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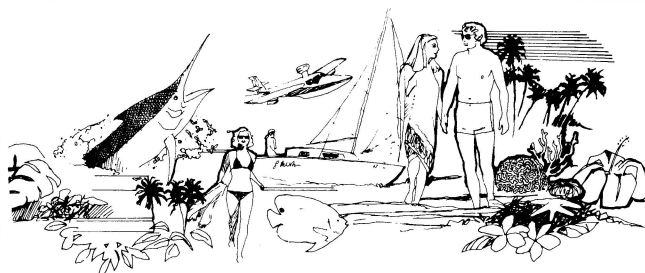
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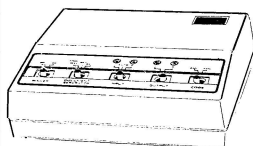
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**All Contributions:** should include your name, address, and home and office phone numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

**Contributions by Telephone:** Contributors who have modems and suitable software (in the MODEM7/YAM mould — see our stories on

Christensen Protocols in the May and June 1983 issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by phone for details on transferring material in this way.

**Contributions on Disk:** Contributions can be accepted in most disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgement. The preferred medium is IBM standard format single-sided, single-density, 20 cm (8 inch) CP/M disks or IBM PC-DOS minifloppies. We can also handle, in-office, most soft-sectored 13 cm (5.25 inch) disks, thanks to PC-Alien — so unless you have a particularly strange format, send it on disk straight from your machine. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

**Listings:** Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error — if the computer typed it, the computer probably accepted it. Print listings with a dark — preferably new — ribbon on white paper, and try to format the output to a narrow (40 characters) width. If they can't be produced on a printer, borrow a good typewriter — hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

**Style:** All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies — no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum. □

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# The Your Computer Bulletin Board

*The Your Computer Bulletin Board Service started back in early '82 and is one of the oldest BB's in Australia.*

*Primarily it's used as a messaging system and a base for distributing public domain software. But, over the next few months, we'll be making the board and the magazine as close to one and the same as we can — and we'd like your input, too, so send us your suggestions (via the BB, preferably).*

ALREADY GOING UP on the board is the YC 6-Year index which has every article, author and story that has been in the magazine. A natural extension of this is to have the actual articles available for viewing and downloading. We can't really put everything there — six years' worth is a lot to type in. What will be definitely there, though, are the tutorials on Basic, C, and Assembler (and an up-coming one on FORTH) just in case you'd like a refresher, or are looking to learn another language.

Of course, the example programs that go with them will be there for you to try out as well.

We'll also have a lot more Public Domain programs up on the system during the next few months. In the meantime, I'm still tracking down those nasty little gremlins which always follow a depressed sysop.

Just to give you something to think about, here are a few well-worth-while reading comments from the board...

-----  
Does anyone reading this message have an interest in family history research? If so, do you use your computer for it? I would like to know what programs are available under CP/M specifically for family history work. Leave me a message.  
Lindsay Swadling, #5933.  
-----

Why is it that one of the most brilliant developments in the world of personal computing is virtually being ignored by Your Computer magazine. How about a bit more coverage for all those seasoned readers who must aching to know a little more about what could be the next biggest seller in the small business, and upper hobby level of the market. If you don't think it's a hit, perhaps you should have a chat to a few guys in the US, especially in LA where the AMIGA is big business. All the real software houses a well behind this machine. Please, you're a pretty good mag at times, don't forget the Amiga.  
Regards, Andrew Farrell

Recently I had the honour of using the new Commodore Amiga. To my surprise all its claims to Fame were true. I was impressed to no end. The machine I was using had one megabyte on board and an external drive. The additional drive however, hardly seemed necessary as the internal one operated at a brisk speed indeed. A 300k demonstration program booted in about what seemed like 5 seconds! The bouncing ball program was indeed very sophisticated as was the image of a digitized baboon face. I strongly urge any hacks out there to get off their rumps and venture down to their local store for a demo. I guarantee you'll want to throw your current system away! Has anyone seen the new atari 520ST in operation. I'd like to ar from anyone who has.....Graeme (bye)

-----  
One thing I really love about this BBS is the feeling of space... Space to leave messages... Man its just fantastic... Plasmic even - Like who the hell rings this system... Perhaps its time for a bit of PR work EY?  
Regards, Andrew

There hs got to be people ringing this system, as it is occasionally engaged. So why don't you leave a message! Just say Hello... do something. In fact, since you're all so talkative, why don't we have a big yarn about something a little controversial... How about it? Sex, Drugs, Politics, Piracy, Computers, Religion... whatever takes your fancy... go on... try me... I'll be waiting... waiting... waiting... and waiting and waiting and waiting and waiting... and waiting a d w a t g a d g  
... "snore... glugghghghg snore..."

I think this was one of the first BBS online in Sydney. At the time it was great, but as the years have gone by the system has remained static. The software by todays standards is cumbersome, there is much moving from menu to menu eg. to place a notice after reading notices. Also to many keystrokes often required eg. to retrieve multiple messages and after all these years we are still only numbers, still no names. If this system is to survive it needs new software as well as providing members with something different. Once upon a time nearly all program listings that appeared in YC were available for downloading. Nowadays, very few if any. Also, 14 lines is often not enough space if one is involved in lengthy discussion.  
PLEASE \*\*\* NEW SOFTWARE \*\*\*

Very true - this board was one of the first up and running in Sydney. I can remember many a sleepless night was had trying to reach this board now its a piece pie! Speaking of pies, that's about how up to date this software is - about as up to date as a 3 month old pie! Maybe its the users fault too - never leaving messages..... Looks as though if this board is going to make a comeback and regin some of its former glory its going to require some effort from both the users and SYSOP! (Who never answers me)  
Regards, Andrew

With all the best will in the world, you'd have to agree with previous notices about the old board. She ain't what she used to be... Main value for me at present is having a board to connect to to test whether latest comms. program update and modem connections are working. I suppose that's something. But why not bring back some of the public domain stuff that used to be available - even the updates of comms. programs, so the board serves that simple purpose of helping some get started on comms. etc. I contribute p.d stuff to other boards when I can. I used to here -- long ago. But I prefer a two-way process, and there ain't much here. So what about some SIGM PCBLUE CPMUG etc ? Just so there's SOMETHING here?

The plan for this system is to put software on-line in bulk rather than taking individual requests. We will rotate the software in 10 Mbyte chunks, but will also consider single-volume mounts as time permits. A description of what is (?) on-line WILL be provided. What we have asked for is requests/suggestions on where we start - what TYPE of programs does everyone want? Are there any particularly popular volumes we should mount more or less permanently? So far there has been virtually no response to our request for suggestions! (at time of pub.) Messages can be left here, or by PMAIL to member number 1.

=> sysop

# BULLETIN BOARD

**new**

## NEWSFLASH

**new**

The *Your Computer* Bulletin Board is back online with an all new phone number — ready to make your micro work harder, for business *and* pleasure.

Find that hard (disk) to imagine? How else are we going to be able to share our 50-plus megabytes of neatly catalogued public domain software — *and it's growing!* Following a few fancy manoeuvres from friendly Fujitsu, our new whizz-bang ever-whirring fixed drive has been loaded up with the first 10 megabyte batch. That leaves us plenty of room to slap up —

- The regularly updated, cross-referenced index to *Your Computer* articles.
- Our database of the new products listed in the magazine each month.
- Sample programs from dLetter (in case you didn't know, dLetter — for dBase II and III users — goes out FREE with subscription copies of the magazine).
- And many of those useful bits of code we publish in the magazine — yours for the downloading.
- That still leaves enough space for you to leave messages of greeting, praise and bribery.

Old-time users of our Bulletin Board (patient lot that you've been) will especially appreciate the —

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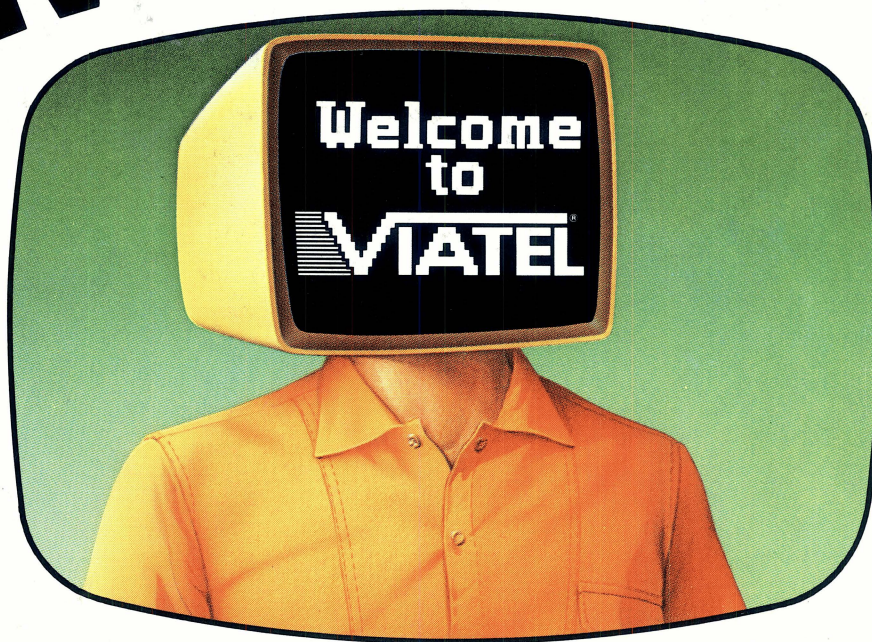
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